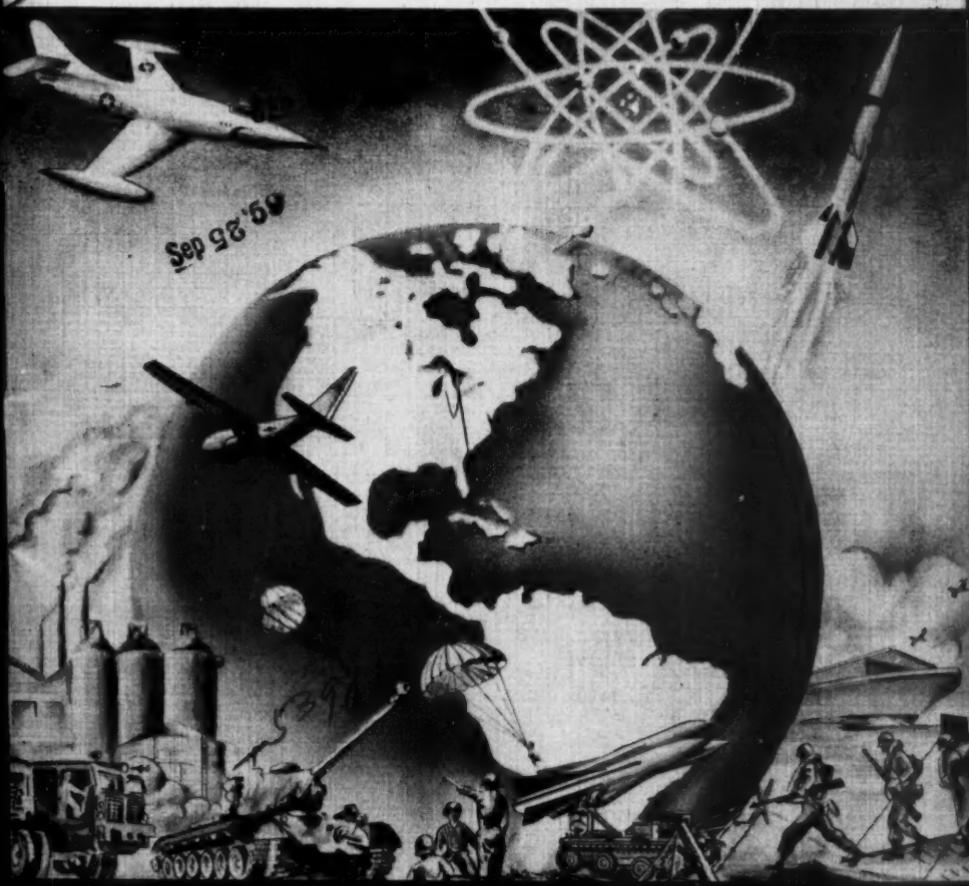


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TOWARD A NEW BIRTH OF CONFIDENCE



George Fielding Eliot

From living together, and obeying the same chiefs, from commanding the same men, from sharing fatigue and rest, from cooperation among men who quickly understand each other in the execution of warlike movements, may be bred brotherhood, professional knowledge, sentiment, above all unity. . . . And now confidence appears.

Colonel Ardent du Picq, French Army: *Battle Studies*

THE Army of the United States includes within its ranks three categories of soldiers—Regulars, National Guardsmen, and Reservists. The Regular Army and the National Guard (or the State Militia which was its predecessor) are as old as the Republic which they serve. The Army Reserve as an organized military component is considerably more youthful, although in a sense the trained Reservist of today is the successor of the untrained volunteer who made up the bulk of our Army in wars of the more leisurely past.

The need for a greater spiritual as well as organizational unity among these sev-

eral elements which together make up our Army has long been recognized and has been the subject of much study and many staff papers, reports, and recommendations. Unfortunately, the earnest seekers after efficient organization have not always recognized that the indispensable cement of a structure of military unity must be confidence, and that confidence has its dwelling place in human minds and hearts.

Unity in any military organization begins at the bottom level—with the individuals of whom the organization is composed. It cannot be achieved by draw-

The Reservist, National Guardsman, and Regular are all members of the same Army—"One Army"—which must be based on the mutual confidence and respect of all components and is dedicated to the cause of freedom

ing neat charts with little rectangles connected by solid or dotted lines. It can be achieved only when the human beings represented by these rectangles have a common feeling of *belonging together*, of sharing a common purpose and common ideals.

If the ideal of "One Army" is to be realized in fact, we must begin by facing and accepting the fact that the Army as we know it today is a natural and living growth, a part of our national life with its roots deep in the past trials and accomplishments of the Nation. We cannot tear up those roots and start over again. Even if that would accomplish some organizational miracle of efficiency—which is questionable—we do not have time for any such wholesale reshuffling. We face a formidable and determined enemy who will not allow us time out to tear down the existing structure and build a new one. The structure of our unified Army must be built with the organizational materials at hand, and cemented with confidence nurtured in the minds and hearts of those who wear the Army's uniform or who serve it as civilians.

Wartime Unity Temporary

Our present opportunity to accomplish this purpose has its origin in the continuing threat to the Nation's security pre-

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sented by the announced purpose of the Communist states to destroy our way of life, extinguish the lamp of human liberty, and reduce the world to vassalage. Always before this era of continuing peril, the historic elements of our Army

—Regulars, National Guardsmen or militiamen, and Reservists and/or raw volunteers—have come together as soldiers only temporarily and for the accomplishment of a purpose which, when fulfilled, put an immediate end to such unity as had been achieved on the battlefield. The feeling of mutual confidence which was born of sharing in the common perils and achievements of war faded quickly as the echoes of the last shots died away. The common image of the soldier became a nostalgic memory, revived dimly and sporadically in the occasional mellowness of veteran reunions.

The Regular Army and the National Guard in their peacetime existence went their separate ways, evolving disparate soldier-images of themselves which replaced the unified wartime image. The volunteers simply went home and forgot the Army. When the Army Reserve came into being, it was viewed by a succession of orderly minded planners in the Regular Army as a means of replacing the complications of the dual Federal-State control of the National Guard with a neat, tidy Ready Reserve force wholly controlled by the General Staff. It was naturally viewed by the National Guard chiefly as a vehicle for realizing this dream, long the bugbear of the National Guard Association. The net result of all this could be variously described according to one's viewpoint, but certainly not as unity—or mutual confidence—from any viewpoint.

Some small measure of unity and confidence was, however, generated during the last half century by the slow evolution of policies designed to improve the combat readiness of the National Guard

and later, also, of the Army Reserve. These policies brought Regular officers into closer association with Guard and Reserve units; Guard and Reserve officers attended Army schools and were required to meet certain standards of professional competence. Federal pay for armory and field training and Federal apportionment of Guard units among the states in order to establish a balanced divisional structure were among other steps in the direction of greater unity. Two World Wars proved the value of these measures—and also their insufficiency to meet the shortening time limits of the modern world.

Three years after World War II ended we find a highly competent civilian-military committee reporting to the Secretary of Defense that the National Guard should be brought wholly under Federal control as a preliminary to the establishment of a comprehensive program of training and instruction to improve its readiness for future emergencies. To this committee, headed by Gordon Gray, then Assistant Secretary of the Army, the conclusion seemed inescapable that an efficient Ready Reserve program for the Army demanded one reserve force only, a federally directed reserve. The National Guard Association and the local political influences associated with it defeated this proposal, as they had others like it in the past. Whatever the cogency of the theoretical arguments of the Gray Committee, the dual Federal-State status of the National Guard remained a stubborn political fact, entrenched not only in the Constitution and the laws of the land but in the traditions of the people and the hearts of thousands of communities to whom the soldier-image represented by the boys of Company K, at the armory down on Main Street, was far clearer and dearer than that of the rarely seen Regular. Neither the heated words uttered during this controversy nor the resentment and suspicion which were its aftermath contributed to unity and

confidence among the several components of the Army of the United States.

Enemy Threat Helps

The enemy, however, soon began proffering contributions of his own to that essential purpose. The Nation as a whole came rather suddenly, as such historical eye openings go, to the realization that new and terrible dangers were at hand—dangers which might endure for many years to come and of which the end could not be foreseen. Time could no longer be purchased safely at the price of the blood of untrained volunteers, or bought for us by allies while we prepared. We found ourselves where we are today—in the front-line, facing a powerful and relentless foe bent on the destruction of human liberties throughout the world. The Russian and Chinese revolutions which have given the control of such vast resources into the hands of Communist leaders coincided with the technological revolution which has so reduced the time factors involved in either the global movement of forces or the delivery of nuclear weapons from continent to continent as to eclipse any hope of training men to fight a war after the war has started. *Whether full time or part time, our combat manpower must be given in peacetime whatever measure of training it requires to meet its scheduled wartime responsibilities.*

During the years since these grim truths have become apparent there has been a remarkable improvement in the combat readiness of the Army's Reserve components. With this improvement, born of stern necessity, has come the slow erosion of old contentious attitudes, the slow healing of old wounds. But much remains to be done, with time and the enemy still pressing on our remaining moments of opportunity.

We are, today, maintaining a far larger Active Army than ever before in the absence of a shooting war. But what with

rising costs and the demands of other essential military expenditures, it is neither politically nor economically possible to keep up an Active Army of sufficient size to deal with all foreseeable emergencies. The time limits being what they are, this simply means that *the peacetime level of readiness of the reinforcing citizen components of the Army must be such that the interval between M-day and their programmed entry into action will suffice to bring them to full combat readiness.*

This time interval is a matter of a few minutes for the air defense missile battalions of the National Guard; of a few days for the Priority I supporting units of the Army Reserve; of a few weeks for certain Guard and Reserve combat units which must be ready to ship out as closely as possible behind the STRAF (Strategic Army Forces) units of the Active Army. The time interval varies from hours to weeks for the tens of thousands of individually trained mobilization fillers needed to bring all these units (Regular, Guard, and Reserve) up to full establishment in the matters of men and materiel.

Becoming "One Army"

These demands presuppose a fully integrated Army—"One Army" in spirit as well as name. Its elements have become interdependent parts of an indivisible whole. The Active Army, in peacetime chiefly Regular in numbers, still includes Guardsmen and Reservists on active duty. The National Guard depends on fully trained Reserve mobilization fillers to raise its high-priority units from 71 to 100 percent manpower levels, and on Regular schools and training establishments to provide it with trained officers and six-months' trainees to fill its peacetime ranks. The Reserve looks to the Active Army to take care of its framework of organization and its training requirements. All these officers and men wear the same uniform, obey the same chiefs, train toward

a common purpose within understood and exigent time limits, and acknowledge common standards of professional accomplishment.

And now, at last, confidence begins to appear.

It is confidence born of unity under common trials and pressures—of the same order as the "One Army" unity which has been the product of the battlefield, but more durable because of the circumstances of its birth. It is the presence of *continuing* peril which demands a higher level of readiness for all components of the Army—and it is in the course of producing this higher level of readiness that the individual officer and soldier begins to think of himself less as a member of a component of the Army and more as a soldier of one Army.

After the fashion of good soldiers of all lands and all ages, he identifies his pride in his unit with the larger if less tangible pride of just being a soldier in the finest Army in the world. The wider his horizons, the wider the scope of the vision in which the images of that pride are identifiable—but the pride of Private X at being a member of the best battery of field artillery in the Tennessee National Guard is cut from the same spiritual cloth as the pride of Colonel Y as he watches his beloved armored cavalry regiment deploy for maneuvers in Germany. Private X's pride may inspire him to no greater ambition for the moment than to be the best man of his military occupational specialty in the battery and thus to become a private first class. Colonel Y's pride assures him that if the balloon goes up, the Soviet mechanized division that tries to overrun his regiment may succeed in its purpose but will be of small value thereafter to Mr. Khrushchev. He hopes the Soviets know this—the sum of such risks adds up to a measure of deterrence, and that is why Colonel Y's regiment is in Germany in the first place.

Two Grave Challenges

The clearer the demands of the Nation upon its Army, the greater the pride and, therefore, the unity of the Army—and, therefore, its confidence in itself.

It is an Army composed of Americans—and Americans respond to challenge.

The challenges which the Army faces take one of two forms.

The enemy, pursuing his implacable purpose of world domination, may seek to accomplish it by surprise nuclear attack on the bases of our own nuclear striking forces. Such an attack might involve large areas of the United States, and—if and when the enemy acquires a sufficient ballistic missile capability—could arrive with zero warning or at best warning on the order of 20 to 30 minutes. In such circumstances, overseas movement of troops might well be impossible or impracticable, at least for a time.

The initial task of all elements and individuals of the Army in the Continental United States would be to go into action wherever they happened to be, in accordance with established plans, to maintain order, save lives, keep transportation moving, provide security against airborne attack and saboteurs, and deal with whatever other emergencies might confront them. They would have to do this with the means immediately available. *In such circumstances, the man in uniform—the ground combat soldier—will be the visible symbol of national unity and of the will to resist, even under the shock of unparalleled disaster.* It will matter little whether the man inside an Army uniform at any particular place is a Regular, a Guardsman, or a Reservist. It will matter a great deal that he shall worthily present to the eyes and minds of stricken civilians the image of the Soldier.

Far away across the seas other soldiers will be engaged in combat against deadly odds. On the seas and in the skies their comrades of the Navy, Marines, and Air

Force will be playing their gallant parts in the effort to turn disaster into victory. But to the inhabitants of a shattered city the soldier will be the embodiment of the Nation's hope—the living promise that this horror of destruction is not the end, that the tide of war will turn as it has so often been turned before by men who wore the uniform of the United States Army.

But this all-out nuclear challenge is, in the context of present conditions and the foreseeable state of the balance of power, less likely to confront our Army in the immediate future than the more limited challenge arising from local Communist aggression. As long as we maintain a powerful retaliatory force adequate to destroy the Soviet Union as a going concern if the Soviets seek to destroy us, and as long as we have the wisdom and foresight to make sure that this retaliatory force is relatively invulnerable to a surprise knockout—preferably by attention to the principle of mobility in its deployment—there is every likelihood that the coldly calculating Communist mind will reject the concept of mutual suicide as a suitable means of attaining a Communist world.

It is far more likely that Communist leaders will continue, as in the past, to seek their objective piecemeal—after cautiously probing for soft spots where the risk is outweighed by the prospects of success.

To meet this challenge it will be necessary—as experience has shown—to put armed soldiers on the ground for the protection of the threatened people or community. Sometimes indigenous troops can serve this purpose, with or without American arms and leadership. Sometimes there will be no other way to meet the danger save by the prompt appearance of American combat troops in the danger zone.

Time, again, will be the critical factor. The location of future emergencies of this type cannot be foreseen; neither can their size or their endurance. The next emergency may be a Lebanon, to be settled by a handful of Army and Marine battalions without firing a shot—all over in three months or so. Or it may be a Korea, demanding all available divisions of the Regular Army and the mobilization of a considerable number of National Guard and Reserve divisions and other combat and support units plus a flood of individual replacements and fillers—and lasting through years of bloody combat. No crystal ball in the Pentagon or the Central Intelligence Agency can tell us where, when, how big, or how long lasting will be the next emergency our Army will have to meet. *Of two things only we may be sure—we will need ground combat soldiers, and we must train them beforehand.*

The problem is to have enough trained soldiers ready to meet the need, whatever its dimensions. This is a problem which has to be hammered out annually in the course of the never-ending recurrence of the budget process. Regular troops cost money. Adequately trained citizen troops cost money—not as much as Regulars, but a lot more than they used to because they must have a far higher level of readiness than ever before. There are many other demands on the national resources available for defense—the Navy, the Air Force, and the Marines. The costs of material and skilled labor are rising. The cost and complexity of modern weapons systems is skyrocketing with the speed of a ballistic missile. The Army, like its sister services, must pay more to keep skilled officers and technicians in its ranks, and is shackled to fixed commitments which make difficult the holding out of a margin of uncommitted force against unforeseeable emergencies. There has appeared, moreover, a regrettable—and, if pursued, probably fatal—tendency to make

the Army the low man on the budget totem pole.

Dangerous Illusion

It is easy to say that this tendency is based on the illusion that the combat soldier is an anachronism, and to refute it with reasoned argument. But the illusion persists, and it cannot quickly or easily be exorcised by mere argument; the glamor of giant hardware has caught the public fancy. *The illusion that hardware is everything and the soldier a relic of Valley Forge and Gettysburg can destroy our country*, and there is not time to allow it to be overtaken by sober second thought. It must be dealt with where it originates—at the grass roots level.

Just before the New Year, General Bruce C. Clarke, Commanding General of the United States Continental Army Command, wrote a letter to his Army commanders which expressed this view in characteristically forceful language:

The more I examine the problem of maintaining combat readiness in the face of reductions of personnel and funds, the more I am convinced that the traditional concept of the Army Reserve, National Guard, and Active Army as 'One Army' must be vigorously implemented.

Not only does this apply to standards of training and performance, but to everything we say and do. If parochialism in interservice relations has a cancerous effect upon the Armed Forces, certainly parochialism within the Army would be just as self-destructive if permitted to flourish between our respective components.

The Active Army, Reserve components, and Army civilians represent a force of over four million. If each member were imbued with this concept, we would have a force on the grass roots level in America capable of carrying the story of the Army to our people in the best interest of na-

tional defense and preparedness.

While I know that the Active Army has come a long way in promoting Army unity, I believe that we can do even more to replace the image of the Regular or the Guardsman or the Reservist with the single image of the SOLDIER. Since real unity is an internal as well as external matter, the 'One Army' attitude must pervade all ranks.

I intend to pursue this objective at every opportunity with all appropriate means, and I ask that you do the same.

General Clarke, with true soldierly instinct, has his eye fixed on the decisive point. The fight for an adequate Army cannot be won in annual budget hearings before congressional committees, nor in the infighting of budget preliminaries in a Defense Department smothered under a fixed budget ceiling. It can be won only in the political arena, starting at the grass roots level. That is the arena where the National Guard Association has won its victories in its fight to preserve the dearly cherished association of its units with their states and communities. That is the arena where its younger colleague, the Reserve Officers' Association, has achieved many successes in its struggle to improve the quality and status of the Reserve components of all the services.

And that is an arena in which the citizen-soldier as an individual and as an organized force can appear boldly and do battle, a privilege denied to the Regular.

What is needed now, if the Army to which both citizen-soldier and Regular belong is to be restored to its rightful and essential place in our Military Establishment, is that the citizen-soldier shall have the motivation to fight in that arena for the Army and not merely for the interests of his particular component.

But that requires the removal of still-existing anxieties as to the latter interests.

It requires realization of the concept of "One Army" not as a slogan but as a living reality.

We have come a long way on that road in the past 10 years.

Unity Is Growing

The interdependence of the three components of the Army, previously noted, is a fact of which all who wear the Army uniform are becoming daily more conscious. The National Guard and the drill-pay units of the Army Reserve are no longer burdened with basic training; their intake is wholly of pretrained men, their training time (all too short as it is) can be spent entirely on unit training. Their officers and men speak and think of themselves as *soldiers*—and they are soldiers. That is not all; they are thought of as soldiers by those who see them.

Earlier this year in Henderson, North Carolina, a National Guard unit was called out under state command to preserve order during a strike riot. A correspondent on the spot wiring a story to a New York paper used these words: "There was no violence as the soldiers enforced the orders of the Court." A few years ago he would almost certainly have said "Guardsmen" or "militiamen." Now he looked at the men of the National Guard going about an unwelcome duty, the sight conveyed to his mind the image of the soldier, and as soldiers he described them.

The Berlin crisis has helped, too, for it has brought again to the urgent attention of all echelons and individuals of the Army their dependence on one another. Those in the Active Army know that if military action is required, they must depend on the Reserve components to supply the necessary reinforcement of the all-too-small active establishment. The National Guardsmen know that some of their divisions would be heading for staging areas right on the heels of the last STRAF division—with their ranks filled by the trained Reservists of the mobilization pool.

The Reservists in or out of units are proud in the knowledge that the other components could not fully carry out their missions without making use of the Reserves. Throughout all components of the Army there is an awareness of the hostile threat, a pride in the vastly increased readiness of the Army to meet it (as compared with any earlier peacetime era in our history), and a deep anxiety that more has not been done so that our Army would be even readier—and the enemy far more reluctant to offer it challenge.

What to Do Next

All this is progress. But, as General Clarke has said, we can do more. Also we need to do more in a hurry, for the old deep-rooted suspicions and uncertainties are not yet buried. What can we do to hasten the acceptance in the hearts of all ranks of the Army the concept of "One Army" to which all owe loyalty and from which all will receive loyalty in return? Here are a few suggestions:

1. Let the Department of the Army promulgate, over the signature of the Secretary of the Army and/or the Chief of Staff, an official Army directive stating in plain words that the Army accepts the dual Federal-State status of the National Guard as a constitutional and legal fact of American life; that no policies, plans, or programs which suggest alteration of that status will hereafter be put forward by any agency or officer of the Army; that instead, the Department of the Army recognizes certain advantages in this status which have not been fully developed in the interests of the Army as a whole, and that it shall hereafter be the policy at all levels of command to develop and preserve these advantages, to the end that the combat units of the National Guard shall be brought to the highest attainable level of readiness.

2. This might well be followed by appropriate public discussion of the interdependence of the three components, with

proper emphasis on the role of the Army Reserve as well as the National Guard, to promote wide public understanding (now sadly lacking) of the problems and procedures that would attend a partial mobilization as well as total mobilization (which latter contingency, plus nuclear bombs, is the picture that comes into the mind of the average citizen when mobilization is mentioned at all). Widespread exercises during annual Guard and Reserve field training involving the use of mobilization fillers would serve as useful illustrations.

3. It might then be hoped that the National Guard Association would take appropriate action at its next annual convention, in recognition of the new Army policy and looking toward the formulation of association policies implementing and promoting the concept of "One Army." Similar action might be taken by the State Adjutant Generals' Association and the Reserve Officers' Association. As a suitable lubricant for this process, attention should be given to the elimination of minor friction points, and the development of Army policies oriented toward support of Guard and Reserve desires regarding appropriations, training of Reserve Forces Act men, expansion of school opportunities, and rearrangement of school courses in suitable time segments to make them easier for citizen-soldiers to attend. Drill-pay for attendance at Army Reserve schools is a case in point—of course, this costs money, but so do most improvements of this kind.

4. An important step toward eliminating internal friction would be for the National Guard Association to give cordial recognition to the role of the combat units of the Army Reserve. It may be argued that a tidier organization would result from assigning all combat units of the Army's Ready Reserve to the National Guard whose units are, in fact, at higher *average* readiness levels than those of the

Army Reserve. But it is also a fact that there do exist certain Reserve divisions and other combat units with high morale and a significant level of manpower. Any-way the object is not to have a neat organization chart but to promote unity and confidence and create in the minds of all members of the Army the single image of the soldier. This cannot be done unless all are given equal recognition. The National Guard has argued, with some cogency, that it makes little sense to spend money on some of the Reserve divisions which have not yet attained a suitable condition of readiness, while denying the National Guard the force levels and training spaces it needs to keep up the required standards in its units. The author has supported this view as a part of the battle of the budget in one particular year. However, in the context of the suggested "One Army" concept, the controlling idea should be one for all and all for one which throws a different light on the problem. Nothing could be more fatal to confidence than the continuance of budget-sniping by one component at another.

These suggestions are offered, with full realization that they contain controversial elements, in the hope that they may at least stimulate discussion and perhaps result in wider examination of the needs of the Army as a whole, rather than continued concentration on the needs of particular components. Such discussion and examination already are taking place

within all components to some extent. The "One Army" concept is acquiring vitality and velocity. Confidence is appearing. Thoughtful officers, enlisted personnel, and Army civilians are beginning to see the need for more vigorous assertion of the Army's place as a vital element of our national military power: and beyond a well-known checkpoint, this more vigorous assertion can come only from the non-Regulars of the Army. When all speak with one confident voice, the battle will be more than half won.

During the hearings on the Reserve Forces Act in 1955, a veteran Congressman who sat through many such hearings remarked to the writer:

The day when the spokesmen for the Department of the Army, the National Guard Association, and the Reserve Officers' Association walk in here arm in arm with one piece of paper that they have all agreed on beforehand, this Committee will buy it without a dissenting vote—and so will both Houses of Congress. But that has never happened in all the years I've sat here, and I don't expect ever to see it happen.

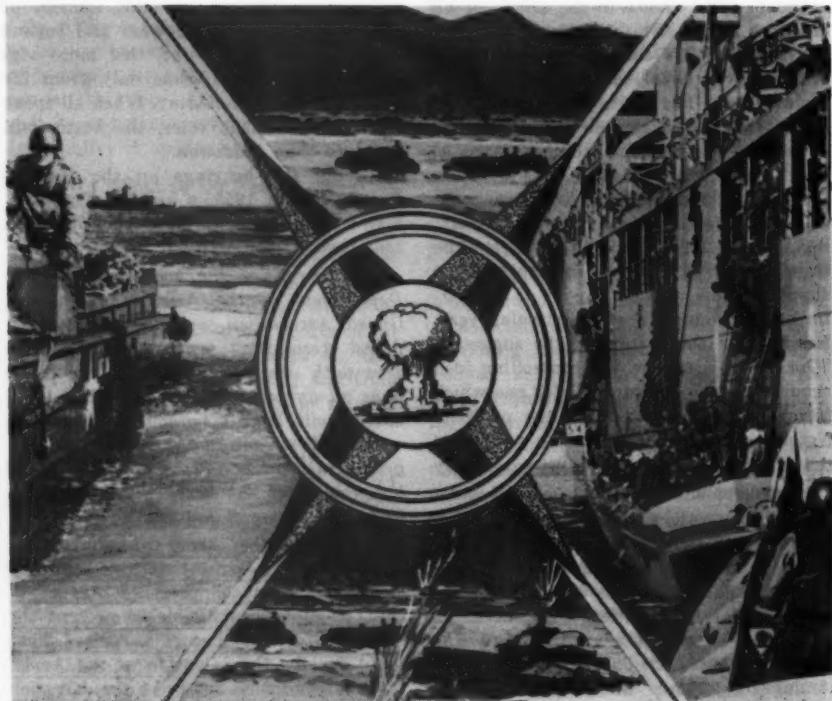
Today, as the Army of the United States begins to sense that it is becoming "One Army" in the presence of the enemy, it might be possible to present the Congress with a happy surprise. That could well be the salvation of the Army. It could even turn out to be the salvation of the Nation one of these days.

The Active Army, the Army Reserve, and the National Guard constitute one dynamic team, each member an indispensable military element of our defense. Each plays an essential role in an organization which has but one purpose, one mission, one reason for its existence—to be poised and ready to meet any threat which might be hurled at our national security.

Secretary of the Army Wilber M. Brucker

EVOLUTION OF UNITED STATES MILITARY STRATEGIC THOUGHT

Colonel Charles H. Donnelly, *United States Army Reserve, Retired*



MIILITARY strategic thought in the United States until the end of the Second World War was relatively uncomplicated. It followed three precepts:

1. Keep out of war if you can.
2. If war should come, keep the com-

bat zone away from the United States.

3. Once involved in war, destroy the armed forces of the enemy as quickly as possible.

War was recognized as a means of carrying out national policy—a means not

The second best hand is not good enough in the international poker game. The stakes are so high that the hole card must be the most powerful military strength and a widely known willingness to use it

to be used except as a last resort but, once engaged in, to be fought with all of the vigor and resources of which the Nation was capable. Complete and early victory was the goal.

The harnessing of nuclear energy and its use in a new weapons system uncovered some implications which have brought about sober reconsideration of strategic thought. Armed force remains an important instrument of national foreign policy but, today, the danger inherent in its use has caused the world powers to turn more frequently to other means of attaining national objectives. These means include use of political or diplomatic pressure; economic measures, such as loans, grants, favorable trade arrangements, and technical cooperation; and psychological methods which include propaganda, threats, gestures of good will, and sometimes domestic policies intended to impress other countries.

Military strategy, therefore, is a part of national strategy which considers all available means by which foreign policies may be implemented and plans the timing,

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sequence, combinations, and degree of effort to be expended on each. While the deadly effectiveness of modern weapons has all but ruled out deliberate warfare between the great powers, smaller countries and factions, not having access to means of mass destruction, are not so inhibited. There is also the possibility of war through miscalculation when a country is maneuvering on the "brink," or through deliberate attack if an aggressor judges a military imbalance to be enough in his favor to enable him to gain a military victory at a price he thinks he can afford to pay.

While a great power will make full use of its political, economic, and psychological means before turning to armed force to gain its ends, it still must have sufficient military strength to make the other means effective. No diplomat wants the embarrassment of negotiating at the council table with his hole card exposed, and that is what happens when his opponents know that he lacks the military strength with which to back his diplomatic moves. He may have plenty of moral strength behind him but, unfortunately, armed force still gets more respect in an international poker game. As long then as armed force remains so important, so will the military strategy by which the use of this force is planned.

The evolution of strategic thinking in the United States has been influenced during the past 13 years by a series of events falling into fairly definite periods. The discussion, therefore, will be presented in that manner.

Demobilization Period

Americans have a quality of directness which tends to make them impatient and unsympathetic with the slow and often devious ways of diplomacy. This same quality causes them—when they find themselves engaged in some disagreeable but inevitable situation, such as war—to try to finish it as quickly as they can so they

can return to what they consider normal living. The end of World War II saw so strong a public demand for fast demobilization that the result was, as General Marshall put it, not demobilization but disintegration.

We were immensely proud of our Armed Forces while the war was still being fought, but as soon as the fighting was over the public lost interest rather quickly in the military. After all, what was the point in keeping up a big armed force? The enemy had been soundly whipped; Soviet Russia had been fighting on our side and that made us friends, did it not? The other nations were either good friends or too weak to pose any threat to our security. Besides, if any trouble did arise the United Nations could take care of it.

The possibility that there might be serious trouble with Soviet Russia did not disturb the man in the street very deeply. How could a nation which had lost between 15 and 20 million people and had suffered such severe damage to its industry and homes offer any serious threat to the United States? It would take them years to recover from their war wounds, we reasoned; besides, allies who fight and bleed together do not turn right around and square off against each other, do they?

This feeling was not unanimous; some military and diplomatic people who had dealt with the Soviets at short range during the war tried to sound a warning but it was not taken very seriously. Even if the Communists did make trouble, only the United States had an atom bomb, said the optimists—although by this time our Armed Forces had disintegrated to the point where effective use of the bomb was doubtful, if the need had arisen.

To sum up, strategic thinking during the demobilization period was almost nonexistent as far as the public was concerned. Military planners, faced with the realities of rapidly dwindling forces as well as public interest in military mat-

ters, revised the national strategic concept to include the vast capabilities of air-nuclear power. However, lethal as it is, an atom bomb by itself is not enough; a balanced military force still is necessary to cope with most situations involving combat. The American forces were becoming more unbalanced by the hour, but this seemed to worry no one except the authorities charged with carrying out occupation and demobilization responsibilities. The popular attitude was: The United Nations would keep the peace.

1946-48: Disillusionment

Within the first few years after the war a series of incidents convinced the American public that Soviet prewar goals for world communization had never been abandoned; they had just been set aside during the war and now they were being pursued as vigorously as ever. Hopes of postwar friendship and cooperation with the Soviet Government began to dwindle.

One of the first evidences of Soviet intransigence was the difficulty which General Hodge had in working out any agreement for establishing an independent government for a united Korea. Then came reports from our representatives on the Allied Control Commissions in Bulgaria and Romania of insults, humiliations, and frustrations. In the United Nations the Baruch Plan for the internationalization of nuclear energy suffered a Soviet rebuff. During this period, too, there were Soviet threats against Iran and Turkey, pressures against Finland, a Communist uprising in Greece, and the overthrow of democratic government in Czechoslovakia.

In the spring of 1948 another event occurred which came to have strategic significance in the United States. With scant warning the Soviet Union cut off all land and water access to West Berlin with the evident purpose of creating a showdown in which the West would have to withdraw or fight. Our ground forces were badly outnumbered by the massive Soviet

Army and the Reds did not seem to be worried about the possible use of our atom bomb. But they made the mistake of underestimating our resourcefulness. We chose neither alternative. Having determined not to be shoved out of Berlin, we came up with the idea of aerial supply of the civilian and military populations of West Berlin; the success of the airlift is a matter of history.

In other instances, threats to the United States had been indirect, as in the case of Greece and Turkey. The Berlin blockade was something else—a direct challenge to the United States. Had the Soviet maneuver succeeded the West would have had to leave Berlin. Once that had occurred, the setback to American prestige would have been so great that it would have been possible for the Soviets to follow with actions which could have meant our complete withdrawal from Germany, possibly from Europe.

The strategic significance of this period is marked by the constant probing of weak spots by the Soviets and by American efforts to salve and bandage the sores at which the Reds kept picking. The pattern of Soviet strategy was quite apparent—to keep the initiative in the cold war, stopping just short of bringing on a general war but never giving any respite. As fast as we quenched one blaze, another was lit; the initiative was with the Soviets and we were always a step behind.

Although it is dangerous to try to evaluate the significance of important events too soon after they occur, it appears that the Soviets may have overstepped themselves when they attempted the Berlin blockade. Our response was so swift, determined, dramatic, and effective that the propaganda loss to them was enormous. Even more important, this was the action which was largely responsible for reversing the trend in the United States which had begun with rapid demobilization. We did two things: we began to reestablish

our military posture and we began to build a new strategy which we had never before used in peacetime—the use of a system of collective defense.

This was an important turning point in American foreign policy. It meant forsaking the traditional policy of avoiding foreign entanglements and it also meant, in the field of foreign relations, that the United States was facing realities, hence maturing. The way for this new policy was opened when on 11 June 1948 the Senate passed the Vandenberg Resolution which informed the President that it was the sense of the Senate that the United States should associate herself "with such regional and other collective arrangements as are based on continuous and effective self-help and mutual aid, and as affect its national security."

Another important development in our strategic thinking came at this time. As part of the plan to reconstitute United States forces to meet the Soviet threat, President Truman advocated adoption of universal military training and, as a temporary measure, immediate revival of conscription. When this came before Congress for consideration, some witnesses at the hearings tried to make out a strong case for air-nuclear power as the answer to our security needs. The House rejected this and in its report preferred the concept of "balanced military forces." This excerpt from the report explains the reason for this action:

... no single military arm can be fully effective unless adequately supported by the other arms. . . . A powerful Air Force is today unquestionably the first line of American defense, but it is not sufficient of itself. It cannot be effectively utilized as an offensive weapon far beyond our shores, except as it is supported and supplied by strong ground and naval forces. A powerful Air Force is not a panacea for security. A 70-group Air Force is not a substitute for Selective Service. The committee con-

siders that nothing could be more dangerous to the national security than for the American people to accept such an illusion.

1949-June 1950: Collective Security

By the spring of 1949 the Soviet Union had called off the Berlin blockade but not soon enough to discourage United States moves toward collective security arrangements. A collateral effect of the blockade was the stationing of two United States strategic bombardment groups in Britain. This gave us a nuclear counterattack capability and led the way to the creation of our strategic airbases in North Africa and Spain. This is the point at which our "massive retaliation" concept began to crystallize.

By the end of 1949 the North Atlantic Treaty Organization had been formed and had adopted a strategic concept which envisioned the use of ground forces (such as we could scrape together at the time), with such support as our fleet could give on the flanks, to delay any attack against Western Europe. We would retaliate with our nuclear bombs. The Soviet Union had exploded a nuclear device in August 1949 but we calculated that it would be some time before the Soviets would have an air-nuclear capability. This event gave the NATO concept added significance and urgency, however.

As we progressed with our collective security plans in 1949, another move took place affecting our Armed Forces. The release from tension which came with the lifting of the Berlin blockade and the lack of any other Soviet irritant moves of importance at the moment was the signal for another period of retrenchment. The size of the Armed Forces was cut so that the gains which had resulted from the Berlin blockade scare were practically canceled by June 1950. The Navy and the Marines were hit a bit harder than the Army and Air Force but all were affected by the economy wave. The Navy had to

scrap the keel which had been laid for the new attack carrier, the *United States*. Since the only adversary in sight was Soviet Russia, ran the argument, and since it had no fleet worthy to be called such, our Navy was gearing up to fight a nonexistent force.

It is interesting and significant that this line of reasoning overlooked the possibilities of limited or small wars; we appeared to be thinking only in terms of possible general war with the Soviet Union.

Congress had voted the funds for the *United States* and the congressional committee had answered the opposition arguments by saying that the service of primary interest was best qualified to judge what weapons it should develop and use; nevertheless, the Secretary of Defense stopped the construction.

Another retrenchment move came in this period. Secretary of State Dean Acheson, in a major policy speech in January 1950, drew a line on the map which delineated our defensive perimeter in the Far East. This line ran from the Aleutians to Japan, thence to the Ryukyus and the Philippines. Korea and Taiwan were outside this line. Secretary Acheson indicated that we could not guarantee these two countries against attack. Although we would continue to help them their security was largely in their own hands. If attacked, we might come to their aid but we made no commitment. As part of our retrenchment policy we had already withdrawn our forces from South Korea and we had none on Taiwan.

To summarize this period: it was the beginning of the new strategy of collective security. The principal contributions of the United States would be the air-nuclear deterrent, plus arms and equipment for the ground and tactical air forces of our allies. Our own tactical forces were to be cut back in order to finance the military assistance program and, at the same time, balance the budget.

June 1950-53: Limited War

Apparently the Communists thought Korea would be a good place to probe next. The danger of starting a world war did not seem too great, since the American flag was not present in the area and we had, in effect, told the world that the South Koreans were on their own.

The invasion of South Korea had the immediate effect of crystallizing our foreign policy toward the Far East. Hitherto we had handled such matters practically on a case by case basis. Again we were responding to Communist initiative and, in doing so, came face to face with a startling fact: we were badly equipped to fight a limited war. It became apparent very quickly that our plans had not seriously taken into account the prospect of our being involved in a small war; our concern had been mostly with the possibility of another world war, not with a limited action at some faraway place such as the mainland of Asia.

Nevertheless, when the North Koreans attacked, our response was immediate and wholehearted. The American policy of helping free countries to avoid inundation by communism was crystallized. People who had sometimes given hypothetical consideration to the possibility of an invasion of South Korea were usually inclined to take a dim view of any American involvement. Faced with the actual fact, however, the American people suddenly realized that here was a challenge to their future way of life and they solidly backed the President's action.

The Korean war has a special significance for American military men. This was the first time that our field commanders had to watch a war end without achieving the military victory of which they believed they were capable. Political objectives became more important than military objectives. They saw the war end without ever having been allowed to use their most effective weapon.

General Douglas A. MacArthur stated the case for military victory during the Senate hearings which followed his relief from duty:

The general definition which for many decades has been accepted was that war was the ultimate process of politics; that when all other political means failed, you then go to force; and when you do that, the balance of control, the balance of concept, the main interest involved, the minute you reach the killing stage, is the control of the military. A theater commander, in any campaign, it not merely limited to the handling of his troops; he commands that whole area politically, economically, and militarily. You have got to trust at that stage of the game when politics fails, and the military takes over, you must trust the military, or otherwise you will have the system that the Soviet once employed of the political commissar, who would run the military as well as the politics of the country.

General Omar Bradley, then Chairman of the Joint Chiefs of Staff, stated the views of the Joint Chiefs of Staff. He said he was under no illusion that the limited war strategy being used would guarantee that a world war would not result but that we could not afford to become more heavily committed, at least until we had improved our military power. General Bradley said:

Red China is not the powerful nation seeking to dominate the world. Frankly, in the opinion of the Joint Chiefs of Staff, this strategy would involve us in the wrong war, at the wrong place, at the wrong time, and with the wrong enemy.

When the truce was finally concluded we had achieved the stated United Nations objectives of repelling armed attack and restoring international security in that area but one could hardly claim that peace had been restored.

Strategic thinking had now accepted the concept that general war between nuclear

powers was too dangerous—not only to the participants but to the rest of the world. Therefore, if war continued to be used to gain foreign policy objectives, it would have to be held within bounds. To do this the objectives must be such that their attainment would not cause either opponent to expand the conflict into a general war.

In Korea the first objective which we tried to attain resulted in expanding the war. The objective was then lowered to reestablishment of the *ante bellum status quo* and this was achieved without further enlarging the conflict. We had learned how to fight a limited war, but some did not particularly like the rules under which it was fought.

1953-October 1957: Deterrence and Economy

We now come to a period when our strategic thinking was centered on effective deterrence of war while we put our fiscal house in order. Since a deterrent, to be effective, must be based upon a strong military force, there is a degree of conflict between the two operations. Major national security expenditures represent around 60 percent of our total national governmental expenditures; hence it is obvious why the military is always a prime target when there is budget balancing or tax cutting to be done. What we needed, the experts said, was a formula which would produce the most defense for a dollar.

Massive Retaliation

At this point the "New Look" planners, as they were referred to, began to give serious thought to the massive retaliation strategy which had really been in effect since the 1948-49 period. By dramatizing this policy it was thought that it might be the answer to both defense and fiscal problems.

The President brought up the massive retaliation policy in his State of the Union message, 7 January 1954, saying: ". . . we and our allies have and will maintain

a massive capability to strike back." A week later this was said again, in more detail, by Secretary of State, John Foster Dulles:

The basic decision [has been taken] to depend primarily upon a great capacity to retaliate, instantly, by means and at places of our own choosing. Now [we] can shape our Military Establishment to fit what is our policy, instead of having to try to be ready to meet the enemy's many choices. That permits of a selection of military means instead of a multiplication of means. As a result, it is now possible to get, and share, more basic security at less cost.

To be an effective deterrent, massive retaliation depends upon two factors: it must be backed by a force which can survive a crushing surprise attack and go on to deliver the same kind of an attack in reprisal; and the potential enemy must be convinced that if we were attacked, we would respond with all of the force at our command.

We had the force in our Strategic Air Command (SAC) and the air-nuclear capability of the Navy. It was about this time that the nuclear tests during Operation *Castle* confirmed that a cheaper, much lighter thermonuclear bomb was feasible than previously had been thought possible. This opened the way to carrying the bomb in lighter aircraft as well as making thermonuclear warheads practicable for long-range missiles.

Nuclear airpower is costly, however, whether it is based on the use of manned bombers or missiles. There was no question of the need to keep this deterrent strong and that meant constant measures to keep it as modern and well-protected from surprise attack as possible. To get the money to do this, one of several things had to be done. Taxes could be raised, nondefense expenditures and foreign military assistance could be cut, or we could trim our tactical forces. It was

never determined whether or not the public would have stood for a tax increase, and domestic policies made it difficult to make sizable cuts in nondefense spending. The Mutual Security Program was showing good results and there were good reasons for not trimming this too much. Something had to give and it was the so-called conventional Armed Forces which took the brunt of the retrenchment.

When Secretary Dulles enunciated the massive retaliation policy in his January 1954 speech, it was quickly interpreted to mean that we were going to depend upon the devastating power of the hydrogen bomb to handle every military conflict which came our way—large or small. There was criticism, both domestic and international. It became so loud in a few months that Mr. Dulles tried to clarify his position. What he had meant, he indicated, was that we "must have the mobility and flexibility to bring collective power to bear against an enemy on a selective or massive basis as conditions may require. . . . It is not our intention to turn every local war into a general war."

The fallacy of relying on massive retaliation as a policy to meet all degrees of aggression is, of course, that you leave yourself no flexibility. A shrewd, aggressively minded nation would calculate that we would never face the opprobrium which would fall upon us if we attempted to solve every brush fire conflict with a thermonuclear bomb. Hence if that is the only weapon in our arsenal, we expose ourselves to being nibbled to death.

Graduated Deterrence

A result of the massive retaliation policy was that some critics began to seek an alternative which would meet our needs without abandoning the deterrent effect of reprisal. One suggestion which had a strong following was "graduated deterrence." By this was meant that aggres-

sions would be dealt with on a "let the punishment fit the crime" basis. It was suggested that mass destruction of enemy populated areas should be renounced by us unless the enemy first attacked our cities. Small conflicts should be handled with only the degree of force needed to do the job.

This policy would not work unless it included a capability of dealing with all types of situations, large and small. In other words, we would need a full limited war capability as well as an effective deterrent to general war. Since cost was a matter of importance, the debate over the size and shape of the forces needed to carry out this concept became rather sharp. The point of the argument was whether to rely on large forces armed with conventional weapons or to attempt to reduce the power of nuclear weapons to tactical dimensions—even to the squad level, some said—and rely on the power of these new weapons to make up the deficiency in conventional forces.

The answer is history; we began to substitute new weapons for men. This necessitated another policy. What limitations should be placed on the use of tactical nuclear weapons? Could they be used without bringing on a general war? Many thought they could. The official position became that we would use nuclear weapons whenever it was to our advantage to do so. This meant that, regardless of the size of the conflict in which we were involved, if there was a military advantage in using a nuclear weapon, we would use it, provided there was no overriding political or other reason why such a weapon should not be used.

In summary, the period from the closing months of the Korean war until the appearance of the *Sputniks* is characterized by the attempt to maintain our national security through a policy of massive retaliation while making a determined effort to put the national budget back into

balance. When the flaws in massive retaliation as a policy were realized, a move was made to broaden the weapons base and to get away from the single-weapon concept of dealing with all conflicts, regardless of size. Economy still was the dominant factor, however, and conventional arms and forces continued to be cut back as the way was opened for use of small-yield nuclear weapons on the battlefield.

October 1957: Post-*Sputnik* Military Thinking

The appearance of the Soviet satellites brought double-barreled reactions. The American people were shocked when they realized how badly they had underestimated the capabilities of the Soviets and were filled with apprehension as to what these new scientific marvels might mean in terms of national security. Space activities had been regarded with a kind of tolerant amusement—something to amuse the children in the comic strips. Now the activities of Buck Rogers suddenly took on stature.

The immediate effect was to put aside fiscal restrictions in order to expedite our outer space and ballistic missile programs and to bolster our strategic deterrent. The SAC dispersal program was expedited and efforts were made to compress the time when the *Polaris* fleet ballistic missile would be operational. The antimissile defense program was given a national priority status, putting it on a par with the intermediate range ballistic missiles and intercontinental ballistic missiles, and strenuous efforts were made to get our own outer space program rolling. Note, however, that this burst of activity was directed largely toward improving our posture toward the threat of general nuclear war.

While we were heavily occupied in our catching-up activities, two minor conflicts, but each having ominous implica-

tions, demanded our serious attention. The situation in the Middle East deteriorated to the point where we thought it necessary to send forces into Lebanon to preserve the integrity of the Lebanese Government. Hardly had this situation cooled when the Communist Chinese threatened—with words and hardware—to take over the offshore islands of Quemoy and Matsu. Again the United States Government took a firm stand and, again, the crisis passed without our forces having had to engage in any actual fighting.

During the period since the first Soviet *Sputnik* appeared, United States military strategic thinking has been centered largely on what is needed to enable us to catch up with (or keep ahead of—depending on the individual point of view) the Soviet Union, and to maintain our ability to meet our military commitments around the world. This has been expressed in the form of debates over the adequacy of our ballistic missile program, the value of aircraft carriers in any future wars, the feasibility of a defense system against hostile ballistic missiles, the value of shelters and other passive defense measures, and the need for limited war capabilities versus general war capabilities.

On one side is the view that it is not only unfeasible but unnecessary to try to match the Soviets man for man, gun for gun, missile for missile, and submarine for submarine; that it is the total strength of our forces against that of the Soviets which is important. This view also takes into consideration the collective strength of our NATO and other allies and holds that we can look to them to supply much of the conventional force strength which might be needed in future crises.

The other view is that, in declining to match the various elements of our military strength with those of the Soviets, we are in danger of becoming outmatched in aggregate strength; some think this has already happened. Those who take

this view point to the tendency on the part of the British and some of our other allies to cut back their own conventional forces as we have done, and for the same reason—economy. They also mention the possibility that, when needed, these forces may not be available because of prior commitments (like the French preoccupation with Algeria) or because of adverse internal situations. Therefore, they hold, we must never let our own military strength deteriorate to the degree that we may have to depend upon the uncertain strength of an alliance to protect our Nation. *They believe in collective security but deplore using it as the keel of our national security.*

What of Tomorrow?

American strategy is still firmly based upon the determination to use our massive retaliatory capability to discourage military attacks against us. This strategy has worked and it should continue to be effective just as long as the Communist bloc does not attain either of these advantages:

1. The capacity to mount a surprise attack on such a scale that they could wipe out the bulk of our retaliation forces with the first blow, leaving us incapable of effective retaliation.

2. A defense so effective that it could reduce the damage from any counterattack we might make sufficiently to make the cost to them worth the gains they might expect to make in the exchange of blows.

There is no effective argument against the correctness of this strategy, or the need to maintain scientific, technological, and military advantage so that the strategy can be implemented. What disturbs many, however, is that in our preoccupation with our deterrent we may be overlooking other threats which may not seem as perilous at the moment but could be just as dangerous over a long period. Termites do not destroy as quickly or sensa-

tionally as fire but, given enough time, they too can make a house uninhabitable.

The Communist leaders have been most adept in the use of all forms of warfare and the fact that they have not made direct military attacks against the United States adds to the insidious nature of the war they practice. The satisfaction which comes with the belief that a big threat has been blocked, at least for the present, tends to make smaller threats seem less ominous. But the Soviets are skilled in all kinds of warfare, hot and cold, and they mix their attacks with the skill of a good quarterback. Under the umbrella of a big threat they have made gains since World War II which may have been small individually but which add to an impressive total.

In the last 12 months Soviet initiative has created two crises and has taken advantage of a third. While the West has been isolating trouble and starting the healing process in one area, the Communists have started jabbing in another. First, it was the Middle East; then Taiwan Strait; now it is Berlin. If Leavenworth had prepared a course on how to conduct modern aggressive warfare, it could hardly have chosen three better examples to illustrate the technique.

So far the United States has been fortunate in having to deal with only one crisis at a time. As a party to eight different bilateral and multilateral defense treaties and with moral obligations to several countries with whom we have no treaties, we have military commitments all over the Free World. What happens if crises arise in several areas at one time? It may have been part of the Soviet plan to avoid this to keep from the possibility of shoving the United States into a mobilization, but can we count on it in the future?

Limited War Capabilities

In the last 500 years important armed conflicts have occurred at the rate of one

every 17½ months; since World War II the rate has been about double this figure. The possibility of limited or brush fire wars is great and, in this troubled post-war period when the upsurge of Nationalist feeling is so great and Communist policy is to stir up trouble rather than alleviate it, it does not seem likely that the trend is about to be reversed.

Some believe that if we are prepared to fight a general war, we can take care of smaller conflicts. That should be true if our forces have retained a flexibility of armament and the capability of rapid deployment to any trouble area. Experience has proved, however, that our big deterrent does not stop small conflicts from starting. For example, it did not hold back the Red Chinese from attacking Quemoy even though they were aware that the United States had a mutual defense treaty with the Nationalist Chinese. Nor is a nuclear weapon carried by a *B-52* or a long-range missile quite the weapon to use in dealing with these small conflicts. Conversely, the deterrent value of conventional forces, both land and sea, has been demonstrated many times.

The sobering effect of combat forces carrying the American flag has been quite evident. Except for some of our military aircraft which were close to Communist territory, there is no known instance of an overt attack against American combat forces since World War II, unless our forces intervened in a situation as they did in Korea. Besides the psychological value of "showing the flag," the United States Army has been instrumental in helping to equip, train, and indoctrinate some 200 allied divisions. The value of having experienced and combat-wise troops teamed with these less experienced divisions was proved during the Korean war.

In a general nuclear war the ground forces might or might not be heavily engaged in the first phase. In the case of a surprise attack, it might be some time be-

fore the Army and Marines came to grips with the enemy. But if a general war were to grow out of a local war, all forces probably would be involved from the beginning. *In either event, the ground forces must be used eventually in order to decide the outcome of the conflict.* No matter how badly hurt a nation may be from a nuclear attack, the final act in its submission comes when the enemy ground forces come in and take over.

With the present trend of replacing men with increased firepower—particularly nuclear weapons—the question facing us is: How much longer will the Army be able to deploy meaningful forces in the trouble spots of the world, maintain a strategic "fire brigade" ready to rush to any place where needed, continue to aid in the building of our allied divisions, provide a cover during, and cadres for, mobilization (if we should be forced into such an unhappy situation), and carry on the multitude of housekeeping chores for itself, the Navy and Air Force, and the other governmental departments? There are still many tasks which must be done by people, regardless of the ingenuity of modern machines.

It is revealing to look at the trend in the strength and expenditures of the Armed Forces over the last few years. The planned size of the Armed Forces as of 30 June 1959 compared to their strengths on 30 June 1955—in percentages of their 1955 strengths—is: Army, 77½ percent; Navy, 95½ percent; Air Force, 88 percent; and Marines, 85 percent. If 1954 figures were used, the percentages would be, respectively: Army, 62 percent; Navy, 87 percent; Air Force, 89 percent; and Marines, 78 percent. However, the 1954 figures are not as fair for comparative use as those of 1955 because the Army had more demobilization to accomplish after the Korean war than the other forces and only part of this had been finished in Fiscal Year 1954.

The expenditures of the military departments for the last six years, including an estimate for Fiscal Year 1959, are:

	Fiscal Years					
	1954	1955	1956	1957	1958	1959 (Estimated)
	(in billions of dollars)					
Army	12.9	8.9	8.7	9.1	9.0	9.2
Navy	11.3	9.7	9.7	10.4	10.9	11.5
Air Force	15.7	16.4	16.7	18.4	18.4	19.0

Since no practicable way has ever been devised of stopping war production simultaneously with cessation of combat, the 1954 figures include, for each service, a carryover resulting from procurement orders placed during the Korean war.

These figures have been presented to illustrate a trend, not to argue that the Navy and Air Force should be cut back so that the Army budget can be increased. The capabilities for deterring or fighting a general war are being developed to higher and higher levels, as indeed they should, but the Army, which is supposed to have the flexibility to deal with limited war situations, finds it increasingly difficult, if not impossible, to keep even.

What is really at stake is a realistic balancing of the Armed Forces. National policy calls for each force to be of the size and effectiveness needed to carry out its own mission. The forces are to be interdependent; to make any one self-sufficient under all circumstances would be unnecessary and much too costly.

Those who contend that mobilization in the future has gone the way of horse cavalry are right to the extent that we can never hope to mobilize behind a cover provided by our allies as we did in the two World Wars. Nevertheless, mobilization under some circumstances probably will be carried out, but only if we have

forces of our own strong enough and deployed in the right places to provide our own mobilization cover.

Concluding Observations

Politico-diplomatic, economic, and psychological warfare tactics are becoming increasingly common and more effective, but only when backed by the threat of strong military forces. The government which commands the greatest military force and is known to be willing to use it is more likely to find listeners, even though they may be unwilling ones.

To ensure national survival, we must maintain a force strong enough to deter a general war, or to fight and win it if it is impossible to avoid. At the same time the importance of a force which will deter smaller wars should not be overlooked. It cost us 18 billion dollars and 142,000 casualties to learn this lesson in 1950-53. Naturally there will still be many small war situations developing regardless of the strength of our forces, but there are likely to be fewer brush fires started of the kind which is likely to bring United States intervention.

The West is solidly behind the United Nations principle of nonaggression. For its own protection, it must have the greatest possible warning of danger from any aggression from other sources. While devices like the DEW Line are essential, forces deployed in areas of potential trouble are also valuable warning agencies. This is true regardless of component.

How much can the United States afford to spend for her defense? Presently, we are spending about 11 percent of our gross national product on major national security—Armed Forces, military assistance to allies, development of nuclear energy, strategic stockpiling, and outer space activities. The Soviet Union appears to be carrying on comparable activities with a gross national product only a fraction of that of the United States. The need to maintain our fiscal and economic soundness is evident, lest we should lose the war through bankruptcy. The alternative would be to make national sacrifices in the way of reduced governmental spending in some nondefense areas or to increase taxes. We could even make some substantial sums available in our mili-

tary budgets by better long-range planning and avoidance of "crash programs" which always are costly because of unavoidable duplications, overtime, temporary disruption of markets for materials, and the mistakes inherent in any operation which is pushed too rapidly.

If the American people want "comprehensive coverage" insurance from their military forces they can have it, but like all forms of insurance there is a bill for payment attached. The alternative is to take a calculated risk and hope that lightning will strike some other place.

It is hard to believe that the United States cannot afford the cost of first-class protection for something as priceless as our freedom to pursue our American way of life.

The over-all mission of our Armed Forces is unmistakably clear. It is to support our national policies and at the same time to maintain the peace. It is the deterrence of war which is our primary objective—not only the deterrence of the general atomic war about which we hear so much, but also the deterrence or the suppression of situations short of general war which if unarrested may lead to the attrition of our world position, or to the extension of hostilities into the great general war which it is our primary purpose to avoid. In my judgment, all of our Armed Forces—the Army, Navy, and Air Force—must justify their existence by their contribution, present or potential, to the deterrence of war. This viewpoint is a very practical consideration which bears upon the conduct of our daily business. Everything which we do in the Armed Forces must be examined in terms of its contribution to deterrence.

General Maxwell D. Taylor, Retired

UNCONVENTIONAL FORCES-- The Commander's Untapped Resources

Lieutenant Colonel Frank A. Gleason, Jr., *Corps of Engineers*
Faculty, U. S. Army Command and General Staff College

This article is in consonance with current instruction at the United States Army Command and General Staff College.—Editor.

UNCONVENTIONAL Warfare, one of the oldest forms of war, is receiving increased consideration within the Military Establishment. This is understandable since the demands placed on the services today in the atmosphere of cold war and limited war with the ever-present threat of general war require the marshalling of all forms of combat power. It is becoming increasingly clear that the combat power resources available from unconventional forces are significant and must be thoroughly exploited in future wars and situations short of war. Unconventional forces represent a form of combat power which adds a new dimension of warfare to that offered by our conventional ground, sea, and air forces.

Nature of Unconventional Warfare

Unconventional Warfare (UW) is a general expression which designates all those resistance activities conducted within the enemy's sphere of influence primarily utilizing indigenous personnel and resources in furtherance of military, political, or economic objectives. The major components are guerrilla warfare, psy-

chological warfare as it pertains to all phases of unconventional warfare, sabotage, subversion against hostile states, and evasion and escape. These resistance activities may be completely overt, completely covert, or something between these two extremes, depending upon the effectiveness of the enemy's countermeasures.

Resistance begins with individual resentment toward the established regime—dissatisfaction with things as they are and a desire for change. The individuals who feel this bitterness toward the government or occupying power have no collective plan of action initially, although they may be performing individual acts of resistance. Organization of the resistance movement may develop spontaneously under initiative of a strong natural leader, or it may be through the efforts of a representative of an outside sponsoring power which is hostile to the occupying power. In either case, the development of a resistance movement is influenced by certain factors, such as the national character of the people, the geography of the area, the civilian support, outside support, and whether or not the enemy's conventional forces are otherwise engaged.

Historical Examples Provide Guidance

History offers many examples of the effectiveness of unconventional forces and their contributions to success in military

Combat power resources which are available from unconventional forces are significant and must be thoroughly and effectively exploited by commanders and their staffs in future wars and situations short of war

campaigns. The resistance activities carried on during and since the end of World War II (Figure 1) have directed our attention more closely to the relationships between unconventional forces and conventional forces. An evaluation of the resistance activity over this period has provided us with some guidance for development of doctrine in this field—to assist the commander in employing this form of combat power.

Benefits derived from unconventional operations far outweigh their cost. In Algeria, a country about the size of California, France has employed up to 400,000 troops to control an estimated 30,000 insurgents. Over the past 10 years approximately 6,000 Chinese guerrillas, operating from bases in mountain jungles, nearly drove the British from Malaya by terrorizing the local populace and conducting terrorist type raids against established authority and lines of communication.

Since the end of World War II communism has extended the Iron and Bamboo Curtains to encompass some 13 countries. Many of these were secured primarily through application of unconventional operations. In the largest country, China, subversives and guerrillas were given strong support by the USSR with little cost to themselves when they turned over

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to the Chinese Communists large quantities of captured Japanese munitions located in Manchuria.

Unconventional forces may have political aspirations inimical to our own. In Yugoslavia during World War II there were two major political factions: one Communist under Tito and the other non-Communist under Mikhalovitch. These two factions were bitter enemies and fought each other throughout the war. Likewise, the Communist inspired *Hukbalahaps* (*Huks*) were armed by the United States in the Philippines and contributed to the defeat of the Japanese. However, two years after the Philippines were granted independence, the Huks took to the hills and resumed their guerrilla operations against the new Philippine Government. These illustrations indicate that a commander when dealing with several political groups must fully understand the political consequences of supporting one group as opposed to another.

Unconventional Warfare may be spontaneous, with no outside sponsorship, or may not be responsive to friendly control or direction. Examples are the Hungarian revolution in 1956 and the recent revolt in Tibet. The intensity of the hatred for oppression which can exist within the "denied areas" has been displayed by these uprisings.

Unconventional operations are most effective when coordinated with conventional operations. On the night of 19-20 June 1944 Russian partisans made a coordinated attack behind the German Army Group Center. The partisans attempted 15,000 sabotage and interdiction missions that night and were successful in 10,500. The entire Army Group Center logistical system temporarily stalled. These activities, coordinated with a Russian offensive, contributed to the complete collapse of the Army Group. Also, the activities of the French Forces of the Interior (FFI) contributed their most effective results during

AREAS OF UNCONVENTIONAL WARFARE ACTIVITIES SINCE WORLD WAR II

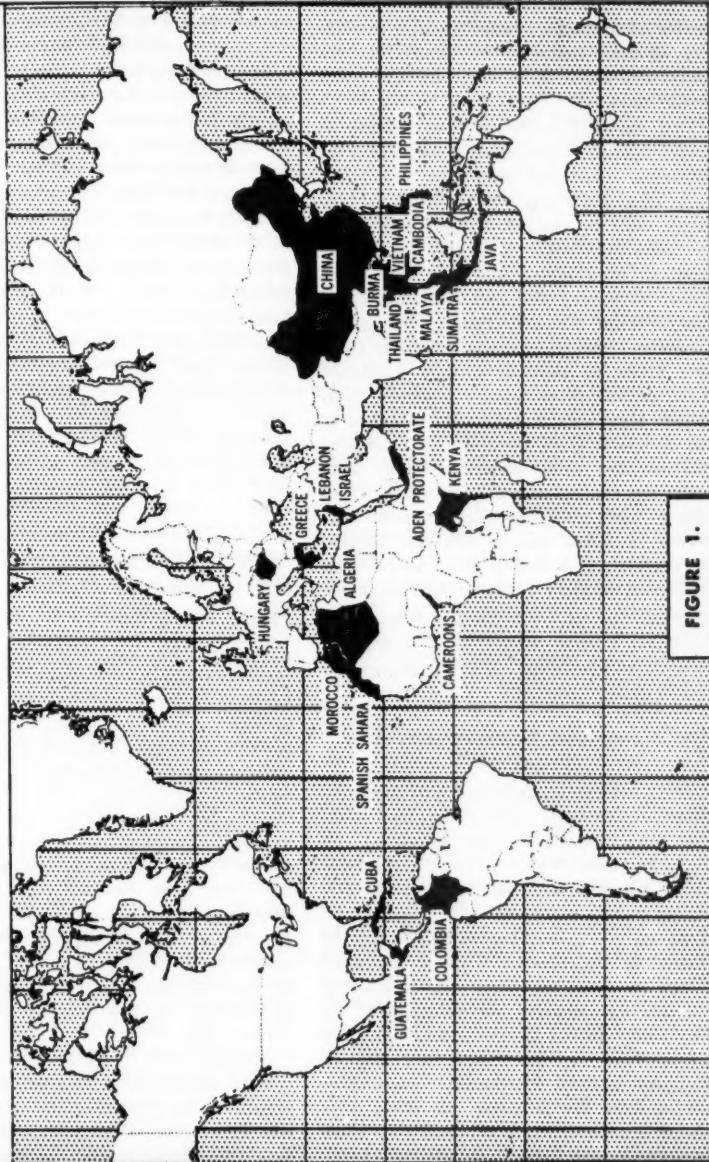


FIGURE 1.

the Normandy invasion and follow-up invasion of southern France. A later evaluation of their activities by General Eisenhower estimated their worth as equivalent to 15 divisions.

The tactical value of unconventional forces becomes increasingly important as offensive operations approach the guerrilla area. Following the landings in Lingayen Gulf by the 6th Army, commanded by General Walter Krueger, the major front created added the last important factor necessary for full exploitation of the guerrilla forces in Luzon. During the campaign, guerrilla troops fought in their own areas as regiments, then combined three regiments to form a division. Regiments, also, were individually attached to US divisions. Here we find as a matter of interest that these guerrilla forces were under the central command of a US Army officer. The guerrilla forces were supported by Army liaison aircraft, tactical air support, and during one major action a 105-mm artillery battalion was attached.

These examples are only a few of the historical lessons which have stimulated thought and imagination in the search for new military concepts.

Unconventional Warfare Potential Is Formidable

The sociological, political, and economic conditions existing behind the Iron Curtain have created a great potential for Unconventional Warfare. The Soviets have under direct domination today some 100 million people in the satellite areas many of whom have a deep-seated hatred for the Communist aggression. This is indicated by the tremendously large standing army and internal security system required by the Soviets in the satellites and has been substantiated by the tragic uprising in Hungary in 1956. Previous to this unsuccessful blow for freedom the world witnessed a smaller scale of unrest in East Germany and Poland.

Operational Environment Favors UW Forces

It is difficult to establish with certainty what future warfare will entail. The probability of general war has diminished under the threat of mutual destruction from intercontinental ballistic missiles and strategic bombing. The most likely form of future conflict is limited war—limited in geographical area, weapons employment, and resources applied. However, whether the next war is limited or general, conventional forces will be employed in smaller, more mobile tactical groupings than ever before and dispersed over much greater areas. This dispersion affords a favorable environment for resistance forces ranging in size from large well-organized guerrilla bands to small groups and even individuals in every walk of life who are ready to assist the conventional forces. Resistance forces are well-adapted to the nuclear battlefield without modification of their traditional tactics.

Special Forces Operate With UW Forces

Within the US Army today special forces units are trained to work with resistance forces in the conduct of military operations behind enemy lines. They are capable of organizing and developing the indigenous resistance potential within enemy territory into effective guerrilla forces. Once such forces have been organized, special forces units equip, train, support, and advise guerrilla forces on how they may conduct resistance activities in support of conventional military operations. Simultaneously, they provide assistance to resistance forces in the fields of guerrilla warfare, intelligence, evasion and escape, and subversion against the enemy state.

Special forces operational teams are tables of organization and equipment units organized to provide appropriate specialists and advisors to accomplish assigned tasks. Weapons specialists, demolitionists,

medical personnel, radio operators, and radio repairmen are typical highly trained personnel who will assist the team leader. There are language specialists on the teams, and all personnel are thoroughly familiar with the people, the customs, and the political, economic, and military aspects of the area of employment. Several types of operational teams are available, their size and composition depending on the mission they are to accomplish.

Special forces operational teams are under the command of a special forces group, airborne. Within an active theater the special forces group establishes a special forces operational base within friendly held areas to provide command, administrative training, technical support, logistical support, and intelligence for special forces teams before and after their commitment.

Control of UW Activities

The theater commander directs the organization of theater Unconventional Warfare forces and assigns missions for the conduct of resistance activities. He may establish a Joint Unconventional Warfare Task Force (JUWTF) composed of elements of two or more services, directly subordinate to the theater commander, or the responsibility for the conduct of resistance activities may be delegated to one of the component commanders. In either case the special forces units constitute the principal Army element of the UW organization.

Initially, operations are conducted by special forces controlled guerrillas in pursuit of missions assigned by theater. At this time theater component commanders may forward requests for specific operations to the commander responsible for the conduct of Unconventional Warfare, who approves the request provided it is within theater policy and the capabilities of the forces available. Later, as the friendly force approaches the area of

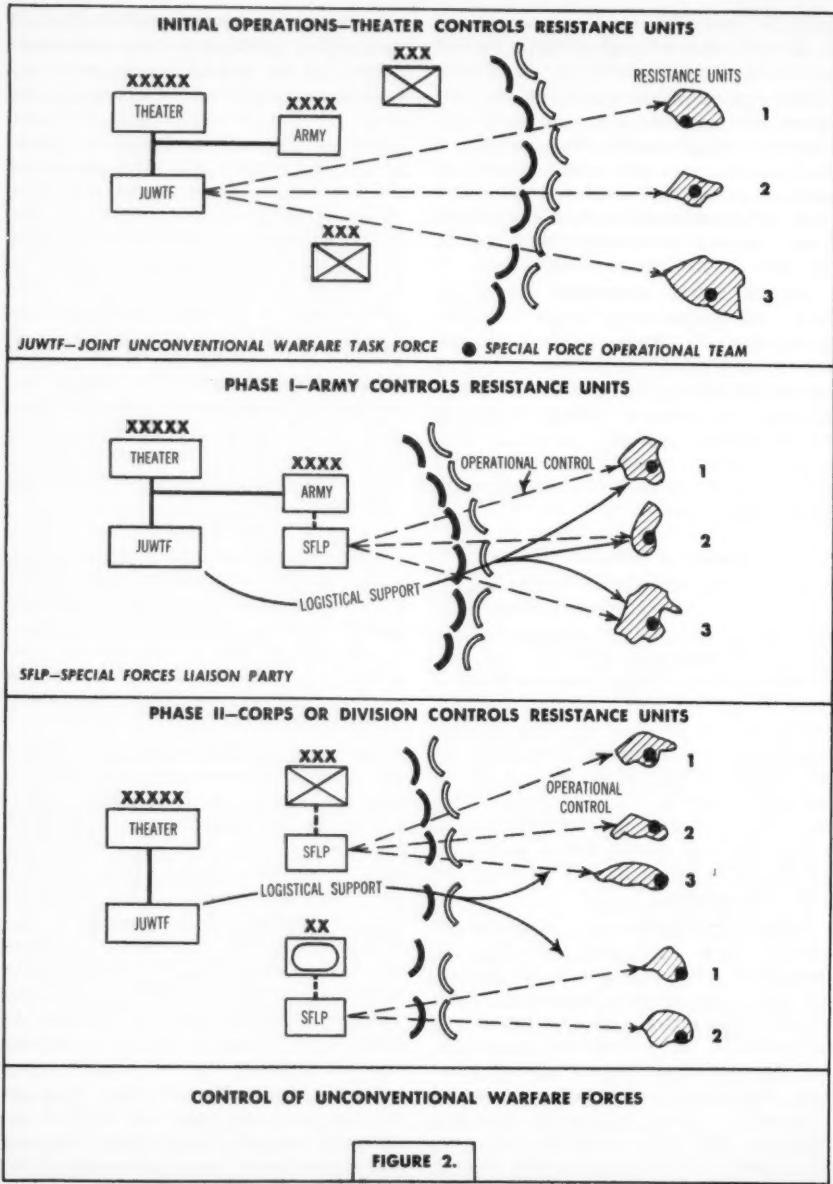
operations of a specific guerrilla force, it normally is desirable to pass operational control of the special forces team controlling the guerrilla force to a field army, corps, or division commander. This simplifies communications, facilitates coordination, and permits maximum support of the conventional force by the guerrillas. A special forces liaison party is attached to the headquarters of a division, corps, or field army when it assumes operational control of a special forces team. This liaison party is capable of communicating directly to the special forces team(s) in the field and with the special forces base. At this time administrative support will continue to be furnished by special forces base, but all operational missions are assigned by the tactical commander who has been given operational control of the team (Figure 2).

UW Missions

Unconventional Warfare activities conducted by the resistance group may cover a broad spectrum varying from extremely covert—such as spreading of rumors or propaganda, or acts of sabotage—to completely overt actions such as open guerrilla warfare. Typical operational and intelligence missions are shown in Figure 3.

Guerrilla warfare, primarily against the enemy's lines of communications, is the best known type of operation accomplished by resistance forces. In offensive situations the commander assigns missions to resistance units which will support the rapid seizure of his objectives and continuation of his mission. In defensive situations the resistance forces can harass, slow down, and dissipate the attacking forces or reserves. The resistance activities may be directed to assist in canalizing the enemy forces and creating lucrative nuclear targets.

During World War II there were instances when the period of tactical cooperation between the guerrilla force and the conventional force was quite brief



even though US personnel were present with the guerrillas. This was usually due to the limited range of weapons available and the rapidity of movement of the conventional force. Increased depth of the area of influence in the future will permit a longer period of tactical cooperation between the two forces.

Guerrilla capabilities in the future will be enhanced by the continuing trend to-

mission. The former includes those activities designed to gain or enhance popular support of the resistance force, or activities intended to confuse the enemy and to create the impression that a large resistance force exists. Operations in the latter category involve the dissemination of propaganda based upon theater psychological warfare themes. The methods of dissemination include overt means such

MISSIONS FOR UNCONVENTIONAL WARFARE FORCES

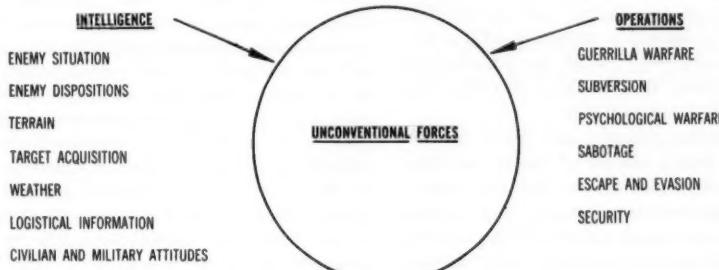


FIGURE 3.

ward low-yield, lightweight nuclear weapons as well as greatly improved nonnuclear weapons, equipment, and vehicles. The increase in organic air vehicles in the forward areas will facilitate tactical reinforcement of guerrilla units, exchange of liaison personnel between guerrilla and conventional forces, and the fulfillment of special logistical requirements and communications.

Psychological warfare operations conducted by unconventional forces fall into two broad categories: those operations in support of the resistance force itself, and those in support of the over-all theater

as the distribution of leaflets and covert means such as the spreading of rumors.

Conventional psychological warfare operations and resistance activities are mutually supporting. An often overlooked capability which the Unconventional Warfare force has for support of the theater psychological warfare effort is in the provision of "output" intelligence. This involves that mass of data which can be verified easily but only by residents of the target area. By including a certain amount of incidental facts concerning the target area—facts which are known to be true or which can be verified easily—the

psychological warfare message gains credibility.

Sabotage operations are a normal activity of resistance forces and should be encouraged, but they should be assigned to resistance forces with great care. Undirected, widespread sabotage activities may cause severe burdens on the commander in subsequent operations. Targets assigned to resistance forces for execution must be evaluated as to value received. Powerplants can be made ineffective without destroying the turbines. Water supply systems can be temporarily cut off without destroying the reservoirs. The objective will be to deny the facilities or resources to the enemy over a specified period. Permanent or excessive destruction of a target may cause the commander serious delay or hardship during later phases of his operations.

Intelligence missions are ideal for resistance forces. Order of battle information, detailed disposition of forces, movements, enemy capabilities, and enemy attitudes are more readily determined by resistance units than many other means. Target information necessary for effective employment of long-range missiles with nuclear warheads is recognized as one of the most difficult problems facing a ground commander. Resistance forces can be assigned missions which can materially contribute to the solution of this problem. These type units extend the range and increase the scope of the commander's intelligence resources far beyond most sources otherwise available to him.

Liaison Teams

Special forces liaison parties attached to corps or division headquarters are necessary to provide the commander and his staff with advice on how best to employ the resistance forces in the commander's area of interest, and to forward assigned missions to operational teams. Coordination will be of increasing importance as

the conventional forces approach the resistance forces' area of operations. Methods of linkup, visual and radio communications, and means of identification must be worked out to prevent inadvertent casualties to the resistance forces or our own troops.

Once a conventional force has reached a resistance force's area of operation, new missions can be executed by the resistance force. It will be normal for our conventional forces to operate over extreme depths and frontages on both the nuclear and nonnuclear battlefield. Resistance forces can be used to augment rear area security forces and assist in securing the lines of communication and patrolling the intervening gaps in our combat area. The utilization of resistance forces in this role will naturally depend on the compatibility of interests at the time. In any event the planning for future employment or disbanding of a particular resistance group must be considered during the early phases of the operation. Our future success in gaining the support from resistance groups hinges upon the respect and treatment given to these units and their leaders during the operational phase and after the area is uncovered by our own forces.

Administrative Support to UW Forces

Administrative support to the resistance forces is just as important as that provided to conventional forces. One of the primary factors which contributed to the defeat of the guerrillas in Malaya and Greece was the elimination of their sources of supply. In enemy areas of control where guerrilla forces or other resistance personnel must operate, the commander must recognize the importance for continuing supply arrangements of food, medical supplies, clothing, weapons, and demolition material. While it is recognized that in many cases the guerrilla force can "live off the land," a large part of its capability will be dissipated if it is supplied only by its own actions. Conse-

quently, the logistical support to resistance forces is provided for by the Joint Unconventional Warfare Task Force at theater level. Although operational control of resistance forces may be successively passed to army, corps, or division as the conventional forces approach the resistance units' area of operation, the logistical support responsibility remains unchanged. This system provides for delivery of material from theater administrative zone facilities directly to operational teams. This minimizes handling and reduces quantities of supplies in the pipeline. After the conventional force has reached a resistance area, then the conventional force assumes the responsibility for support.

One other aspect of supply to resistance forces which should be considered is "broadcast arming." To exploit the resistance potential and speed up resistance activities during the early stages of a conflict, it may be desirable to drop large quantities of weapons and ammunition with instructions on how to use them. This method is an uncontrolled yet quick way of providing dissident groups or individuals with a means to accomplish resistance activities.

Another problem is the "peak" requirement for logistical support brought about by large-scale defections of satellite forces who are willing to join forces with friendly resistance elements. Plans must be made to provide whatever supplies are needed on short notice, if this great potential is to be exploited.

Summary

The effective strength of our conventional forces is increased by using the resistance potential existing in the area of operations. The commander must realize and acknowledge that here is a tangible and definite source of combat power which can provide him with large returns for the effort expended. He must ensure that he and his staff are aware of the friendly resistance potential available in his operational area. He must ensure that he has attached to his command trained personnel who can advise him on the capabilities of the UW potential in his area of operations and recommend suitable missions. Success on the battlefield of the future may depend in a large part on how effectively the commanders and their staffs utilize the full potential available in unconventional forces.

Unconventional Warfare is no longer limited to spontaneous and poorly supported guerrilla efforts which succeed only if favored by the genius of local leadership and plain luck.

Major General Orlando C. Troxel, Jr.

Are You an Imaginative Military Thinker?

Colonel George B. Pickett, Jr., *Armor*
Student, National War College

THE battle is the payoff," but unless the right amount of imaginative military thinking goes into visualizing and planning for that battle, the "payoff" may be for the "wrong" side. To make it pay off for us, we must develop imaginative military thinking to such a degree that we can exploit our professional knowledge to accomplish our missions and tasks successfully.

Imaginative military thinking reflects either the creativity of the individual who evolves the concept, the item of hardware, or the solution to the problem; or it reflects the same results from a deliberate group effort.

Creative individuals have four attributes in common:

1. Problem sensitivity.
2. Idea fluency.
3. Originality.
4. Mental flexibility.

Problem Sensitivity

Problem sensitivity means that the individual can sift through the maze of irrelevant smog surrounding a situation and identify the problem. Further, he can isolate and define it. An expert "problem solver" in college was hired by a big corporation. In a few months he was back at the college looking for a job. "What happened to your problem solving job?" asked his old professor.

"Oh," he said, "they never gave me any problems to solve. Just exposed me to a bunch of messed-up situations."

Imaginative military thinking must be developed so that professional knowledge can be exploited. Receptivity to new ideas and personal ability are requisites for successful accomplishment of missions and tasks

The "messed-up situation" is a challenge to the imaginative military thinker; he searches beneath the symptoms, diagnoses the true cause, and goes to work on it.

Idea Fluency

Piling up many ideas—possible solutions about "messed-up situations"—in a minimum of time is a measure of *idea fluency*. The more potential solutions to pick from, the greater the possibility of obtaining a good one. This, really, is why the person who can think of many solutions to every problem is potentially a better problem solver than good old Joe who dashes to the regulations to find the "closest guidance"—and terminates his creative approach at that point.

To be idea fluent, do not intersperse imagination and judgment. If you get an idea do not start judging it right then but keep thinking about it until you have exhausted all angles. Then, and only then, start to evaluate it. Often this tendency to think—judge—think is what keeps a person from being creative when all he needs is to think—think—think, and eventually to judge his thoughts. Why? Because he has many to compare among themselves for the best. The best of 100 probably is better than the best of one—or two.

Originality

Originality does not mean planned non-conformity. In the Armed Forces it frequently means the finding of some new way to adopt an old idea to new circum-

stances or a new modification of something—or a concept—to make it fit a new requirement. Most highly creative people are overwhelmingly curious. In a plans division the officer with originality can be identified; he asks the most embarrassing questions such as:

"Why do we attack in this direction?"

"Why do we limit ourselves to this course of action?"

"Is the objective in Plan C really the critical objective."

To be truly creative this questioning must be done constructively and not purely to gain notoriety for the questioner. Publicity seekers can be identified for they never contribute answers; they just ask the questions. Generally, their desire is to expose the present way to unconstructive ridicule rather than to be helpful. Pointing out the errors of others to the general makes them look smart—or so they think. The truly creative person asks these questions with the intent of finding a better way to solve the problem or to accomplish the mission; the critic does it as a means of criticizing someone else. Critics rarely are creative. Many Army officers are primarily critics. Are you one?

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Mental Flexibility

A creative flexible person is one in the military who is not panicked by regulations, Department of the Army pamphlets, and the "proven" way. General Speidel, in defending Rommel's plan for defense of the French Coast in May 1944, describes Rundstedt's opposition as being due to "a classical solution by an officer without experience in maneuvering masses of armor under Allied air superiority." The classical solution in Normandy, from the German viewpoint, failed. Rommel's way was not the "proven" way but it is obvious, from hindsight, that it was a better solution than Rundstedt's—which was "proven." A creatively flexible person is synonymous for an objective and open-minded person. Rather than fix his mind on one particular idea or a single approach to a problem, the flexible person remembers that if one solution will not work he can always tackle the problem from another angle and maybe even solve it better.

Training in Imaginative Thinking

Our big problem is to develop and use that great power of creation with which we are endowed at birth: imagination. We have just considered the attributes of a creative person—certainly we can make a deliberate attempt to practice them, but there are other ways which will help us develop those attributes indirectly.

One exercise is to practice getting ideas to flow by picking out a problem, reducing it to a key word or phrase, and then writing under it the first word (idea) that it suggests. Then do the same for the second idea and so on until you have a list of idea generators to spur your thinking.

Another means of developing imagination is to practice creative or imaginative writing. Here, be sure to distinguish between imaginative writing and research papers. This article is not purely imaginative; it is primarily a result of research with some imagination about how to pre-

sent the appeal. Imaginative writing generally applies to fiction. As an exercise, imagine you walk into your office and see a beautiful blonde, age plus-or-minus 25, sitting on your desk. She looks up, smiles, and says: "Hello, there; remember me?" Now don't panic; take a piece of paper and in five minutes write down the title of three short stories based on that scene. Now pick one of those titles and in 15 minutes write out a plot for the story.

If you want some real imaginative exercise sit down and in 250 words or less write out when and how you think the next war will start and what the situation in the Zone of Interior will be on D plus 3. Do not daydream; write it out! Often we think we have clear and lucid ideas about something until we try to put them into words on paper. The real value of the exercise lies in writing it out.

Another exercise in imagination training, and the last to be discussed here, is the "word list" system. Every profession—most of all the military—has certain "job" jargon that, properly used, can prod the imagination. We want idea words. There are many that are used very often without realizing it. Some of the best known are *function, characteristic, leadership, command, form* ("tactical geometry," such as "two up, one back, feed 'em a hot meal" used to be), *new developments, nuclear, nonnuclear, élán, and esprit*; there are many more. Work up a list that pertains to your present assignment.

Now how do these word lists "tickle our imaginations"? Let us try out the system by starting with the *principle of maneuver*. Maneuver—the means to expedite maneuver; this implies *new developments* which, in turn, implies *nuclear weapons*. How can *form* be affected by *nuclear weapons*? The *forms of offensive maneuver* come to mind. One of these is the *penetration*. The first phase of the penetration is the *breakthrough* which can be

accomplished more easily now that we have *nuclear weapons*. This *procedure* frees more troops for the exploiting force. What are the *characteristics* of the exploiting force? One big one is mobility, which is either tactical or strategic. This is kept up until all the idea words are exhausted. When the writer finishes on "maneuver" he ends with: *more mechanization, air-transported armor, and fewer headquarters* on the battlefield as three of many ideas on how to facilitate maneuver and reduce reaction time on tomorrow's nuclear-missile age battlefield.

Group Creativity

Almost everyone has heard of the technique of group creativity called "brainstorming." Because of the danger of confusing its implication with "brainwashing"—a similar sounding but by no means similar meaning word—the technique in military circles is best referred to as "the creative conference" method. In addition to the training exercises just enumerated to foster our creativity when solving problems alone—called solo methods—we need to practice the group methods also.

Arrange some after luncheon sessions with from four to 18 people attending and hold a creative conference on such topics as:

Ideas to cut down on paperwork in your headquarters (that is always good for a fast session).

Ideas to foster more imaginative solutions to problems in your headquarters.

Ideas on how war will be fought in 1968—or 10 years from the date of your conference.

Here are the rules to follow during the conduct of the conference:

Criticism is ruled out during the conference itself. Evaluation of ideas is made after the session by a review board or a group of people who did not participate in the conference. This eliminates pride of authorship.

"Freewheeling" is welcomed. The wilder the idea the better, the theory being that it is easier to whittle down a wild idea than to pump up a pint-size one. You cannot make millions with ideas at the nickel and dime level.

Quantity is emphasized. The greater the number of ideas generated, the more probability that some "winners" will be in the pile.

"Hitchhiking" (combining ideas and adding to ideas already expressed) is encouraged. In addition to offering ideas of their own, participants are urged to suggest how to improve or combine ideas already presented.

A formal conference to solve a real problem is "followed up" by review boards (or analysis by other means such as commanders' estimates, intelligence estimates, troop tests, and user tests) to determine the validity of the ideas evolved in the

conference. Action is taken imaginatively to implement those ideas that survive the review phase. You can easily arrange an informal "murder board" of friends to review your practice session.

Pathways to the Future

Naturally, there is far more to imaginative military thinking than has been covered here; but this can be a starter for you. Ask yourself this question: What does the future hold for me? If you consider it seriously, what your professional future holds for you will depend a great deal upon how well you foresee the future—the future of your profession. Today is the most changing, the most challenging period in military history; and it is not sweat and toil alone at your job that will pay off—it is your receptivity to new ideas and your personal ability as an imaginative military thinker that will make you sought after for the better jobs.

... education must include a practiced familiarity with methods of orderly and logical thought. This is especially important at a time like the present, when we are forging so rapidly ahead in so many fields. We are constantly facing new unknowns. Each forward step exposes still wider horizons that must be explored. The exploration of these horizons of the mind requires methodical procedures. Starting from established principles and known facts, systematic and analytical reasoning is the surest path to the answers to hitherto unsolved questions.

General Lyman L. Lemnitzer

UNITED STATES ARMY, PACIFIC

Material for this article was furnished by Headquarters United States Army, Pacific.—Editor.

FROM the Hawaiian Island chain in the middle of the Pacific to the demilitarized zone in Korea extends a vastly important and delicate area vital to the security of the United States and the Free World.

Within this approximately 12 million-square-mile area lie Hawaii, Korea, Japan, Okinawa, Taiwan, and the Philippines where combat-ready United States Army troops stand guard to meet any attempt at aggression by Communist forces.

Responsibility for the command of these widely dispersed forces was assigned to General I. D. White, Commander in Chief, United States Army, Pacific, on 1 July 1957.

On that date the Far East Command, then in Japan, was disestablished and all United States military commands in the Pacific and Far East were consolidated into one unified command under the Commander in Chief, Pacific.

The United States Army, Pacific is one of the three components of the Pacific Command. The other two components are the United States Pacific Fleet and the Pacific Air Force.

As the Army component commander of the unified command, General White commands all US Army forces in the area, and is responsible for the execution of missions assigned to him by the Com-

mander in Chief, Pacific (CINCPAC), as well as tasks, responsibilities, and functions which are the direct concern of the Department of the Army.

General White organized US Army, Pacific and assumed command following two years as Commanding General, US Army Forces, Far East, and Eighth United States Army. It is General White's policy that there should be maximum decentralization of operational responsibilities within the command, and that his headquarters should be essentially one for planning and policy.

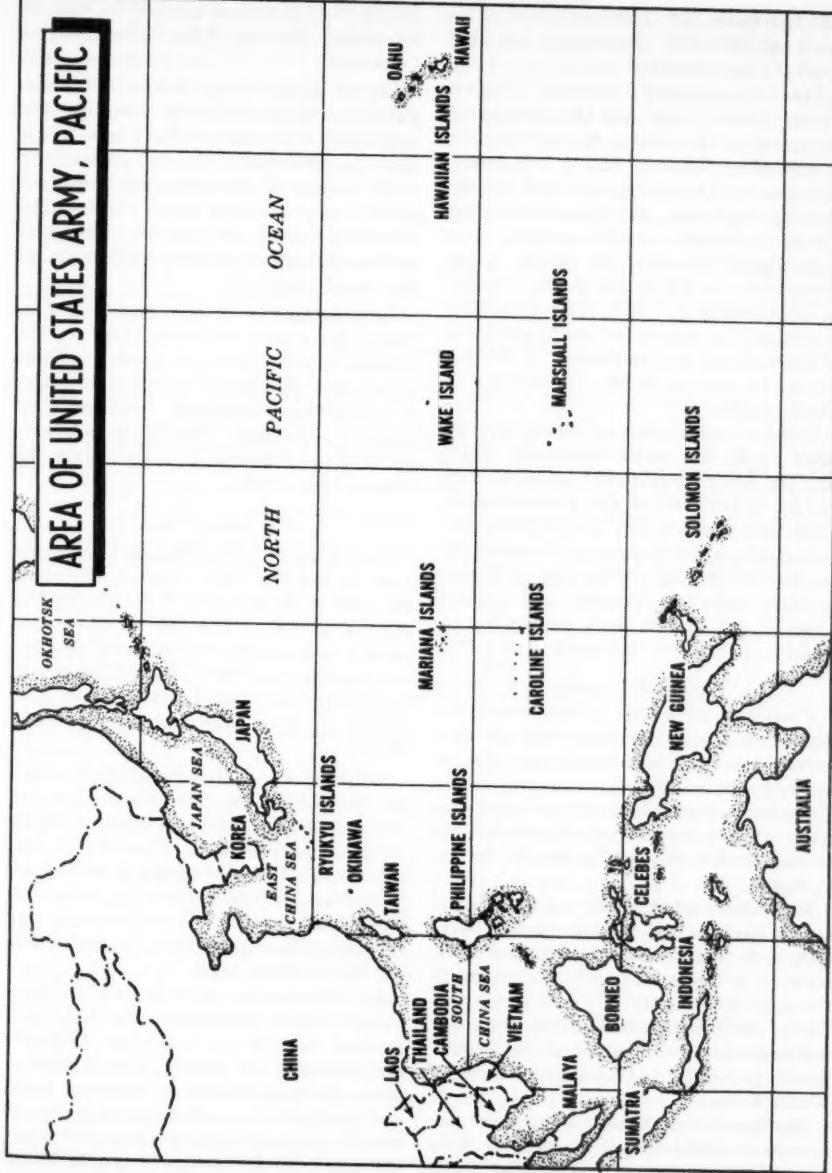
The primary missions assigned to the United States Army, Pacific include:

1. Advance planning for the conduct of operations by United States Army forces as directed by Commander in Chief, Pacific.
2. Collection of intelligence.
3. Providing logistical support for operations as directed by the Commander in Chief, Pacific.
4. Rendering advice and assistance to the Commander in Chief, Pacific, regarding Military Advisory Assistance activities.
5. Furnishing advice and assistance to Commander in Chief, Pacific, on United States Army planning in connection with Southeast Asia Treaty Organization activities.

The United States Army, Pacific Command consists of four major subordinate commands. These are the Eighth United States Army in Korea and Japan, which includes US Army, Japan; the US Army, Ryukyus/IX Corps in Okinawa; the US

United States Army, Pacific, stationed in a vitally important area extending from the Hawaiian Islands to the demilitarized zone of Korea, is a strong link in the Free World's defense against Communist aggression

AREA OF UNITED STATES ARMY, PACIFIC



Army, Hawaii/25th Infantry Division located at Schofield Barracks; and US Army Forces, Taiwan.

The Commanding General, Eighth United States Army, has three command assignments. In addition to his duties as Commanding General, Eighth US Army, he is also the Commander in Chief, United Nations Command, and Commander, US Forces in Korea. As Commanding General, Eighth US Army, he reports to the Commander in Chief, US Army, Pacific; as Commander in Chief, United Nations Command, he reports to the Department of Defense, and as Commander, US Forces, Korea, he reports to the Commander in Chief, Pacific.

Primary communication centers are located in all the major commands which link the Army's worldwide communication system to the tactical and administrative units they support. The geographical distances between commands and between the commander in chief and his principal commanders make the operation and maintenance of this system most challenging to modern science and techniques.

Eighth US Army

Hostilities have been stilled almost six years in Korea, but the guard has not been lowered; battle positions continue to be manned.

Combat-ready soldiers of the Eighth US Army are engaged actively in patrolling a defense sector facing Communist forces in Korea.

Its major combat forces are the 7th Infantry Division and the 1st Cavalry Division, both pentomic. These units and their supporting forces stand with battle-tested forces of the Republic of Korea Army and United Nations Command allies along the demilitarized zone separating the Republic of Korea from Communist-controlled North Korea.

The Republic of Korea's 18 excellent active Army divisions and one Marine division—third largest ground combat force

in the Free World—comprise the bulk of the combat elements of the United Nations Command.

United States Army troops in the Republic of Korea also are providing the equipment and technical know-how to assist the government and its people in a vast program of rehabilitation. Army engineers are directing the reconstruction of powerplants and schools, designing modern irrigation projects, and constructing paved highways.

Representatives of the American Embassy, the Eighth US Army, and the US Information Service have formed a joint Community Relations Committee to assist in promoting community relations. The committee develops community relations projects and publishes information for the Korean population.

US Army, Japan

Once a major United States Army troop area in the Far East, particularly after the close of World War II and during the Korean conflict, Japan now is able to assume a greater share of her own security and provide important logistical bases and facilities to the United States which contribute to Free World strength in the Orient.

Although the United States Army combat forces have been withdrawn from Japan, logistical support operations continue in such places as Kure, Tokorozawa, Yokohama, Chofu, and Sagami in the job of furnishing backup support to troops in Korea and the support to Military Aid Program (MAP) countries in the Western Pacific area.

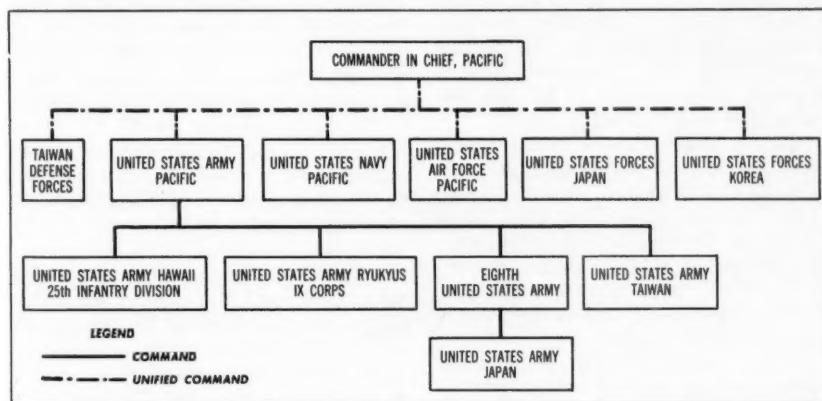
At Tokorozawa military vehicles furnished MAP countries are rebuilt and distributed to recipient countries. Although the countries of Japan, Korea, Philippines, Taiwan, Thailand, Vietnam, Laos, and Cambodia do a certain amount of such rebuild, varying widely according to capability, this installation handles rebuild re-

uirements beyond the capacity of the countries concerned. The work is done by Japanese contractors.

Rebuild operations began with the overhaul of approximately 13,000 US-produced World War II vehicles returned from the Japanese Self-Defense Forces in exchange for new Japanese-produced vehicles that are similar in appearance to United States World War II vehicles. These Japanese-built vehicles have passed the same Army

troops have lived in Japan, they and the Japanese people have built the most altruistic occupation in history into a long record of close and friendly relationship between former enemies.

When the occupation was at its peak, in terms of United States personnel and activities in Japan, the Army occupied thousands of Japanese buildings and millions of square feet of land. The real estate used by the Army in Japan today



performance tests given American-built vehicles.

The depot at Tokorozawa also provides engineer, signal, and ordnance supplies to all MAP supported countries distributed according to need. The General Depot at Sagami, in the Kwanto Plain area, stocks and distributes equipment, spare parts, and other supplies of all technical services.

These operations produce a substantial tonnage of cargo which moves over the docks of the US Army port in Yokohama into and out of the holds of ships of many nations.

Camp Zama, formerly the Japanese military academy, is headquarters for the United States Army forces in Japan. Our Army has used this camp since the end of World War II. In the almost 14 years our

is but a fraction of the former area, and is still shrinking due to consolidation, withdrawal, and a firm policy of returning real estate to Japanese owners as soon as it is no longer needed.

The picture of US Army activities in Japan has changed and is still changing, but the reason for its being there—deterrence of Communist aggression and maintenance of Free World strength—remains the same.

US Army, Ryukyus/IX Corps

Frequently termed the "Keystone of the Pacific," Okinawa is militarily important to the United States and the Free World as a strategically located base from which bomber, amphibious, or airborne operations could be launched to defend territory

on its flanks which might be threatened by enemy aggression.

Under the terms of the Japanese Peace Treaty, the United States Government has the right to exercise all and any powers of administration, legislation, and jurisdiction over the territory and inhabitants of Okinawa and sister islands for an indefinite period.

In recognition of these long-term arrangements, an extensive construction program has been carried on for several years in Okinawa, providing modern, concrete, typhoon-resistant headquarters buildings, hospitals, warehouses, schools, clubs, and homes for use of military and civilian personnel stationed there.

The Commanding General, United States Army, Ryukus, also serves as High Commissioner of the Ryukyu Islands, heading up the United States Civil Administration of the Ryukyu Islands (USCAR). USCAR works closely with the government of the Ryukyu Islands in the promotion of democratic government, in the rehabilitation and development of the Ryukyuan economy, and in effecting the cohesion of the Ryukyu Islands into a unified political, social, and cultural entity.

Since 1947 the United States Congress has appropriated approximately 193 million dollars for the Ryukyu Islands.

More than 63 million dollars of this amount have been spent for food and grains. Fertilizers and seeds in the amount of about 10 millions also have been brought in. About 74 million dollars have been expended for industrial construction, equipment, and raw materials. Petroleum products amounting to about seven million dollars also have been supplied. The remainder of the appropriated funds has been allocated for the procurement of other essential supplies and services, as well as for administrative costs. These expenditures have materially aided the welfare, rehabilitation, reconstruction, and

economic development of the Ryukyu Islands.

Employment is relatively high, with an increase in per capita income from \$119 in prewar times to \$174 in Fiscal Year 1958. Along with this improvement economically has come widespread construction of schools including the erection of a University of Ryukyus which recently graduated 400 students in one class.

Besides sugar, which is the major cash crop and is constantly growing in size, the fishing industry has matured from a subsistence canoe type of industry to modern, power-driven craft, hunting whale and tuna in deep sea fishing and processing frozen marine products for export.

A new industry—pineapple growing and canning—also is developing, and the milling of grains is an assured addition to cut down on import costs.

On the military side of the picture the Commanding General, United States Army, Ryukus/IX Corps, is charged with the ground defense of the Ryukyu Islands and maintenance of a base to support combat operations. He also has been designated as representative of the Commander in Chief, Pacific to handle matters of joint concern among the Armed Forces components stationed in the Ryukyu Islands.

US Army, Hawaii

The US Army, Hawaii 25th Infantry Division has, as its principal function, the performance of US Army missions relating to the Hawaiian area. In addition, the headquarters supports, trains, and maintains facilities at Schofield Barracks for the 25th Infantry Division, the theater strategic Army reserve.

Tactical units of the division conduct annual training exercises at the 115,000-acre Pohakuloa Training Area located between two ancient volcanic peaks on the neighboring island of Hawaii. The base camp consists of several hundred tents and a sprinkling of quonset huts.

Men and equipment including tanks, trucks, and heavy artillery pieces are moved across the 200 miles of Pacific Ocean from Oahu to the island of Hawaii by a combination air-sea lift. Most of the personnel are air-lifted by commercial aircraft and heavy equipment is transported by Navy LST's and commercial barges.

The training area lies between the twin 13,000-foot peaks of Mauna Loa and

the strengthening of United States defenses on Taiwan and the establishment of a fourth subordinate Army command under the United States Army, Pacific.

The Commanding General, US Army Forces, Taiwan, is also Chief of the Military Assistance Advisory Group (MAAG).

To bolster the Navy's United States Seventh Fleet and units of the Air Force and Marines on the Chinese Nationalist



Headquarters United States Army, Pacific, Fort Shafter, Hawaii

Mauna Kea, two of the largest volcanoes in the world—one extinct, one active. The area contains many old lava flows and deep ravines making it just about as rugged a territory as a foot soldier can ever expect to find.

US Army Forces, Taiwan

The shelling of the offshore islands in the Taiwan Straits by the Chinese Communists in September 1958 resulted in

island stronghold, the Army dispatched the 2d Missile Battalion (*Nike Hercules*), 71st Artillery Regiment, which became operational on 25 October 1958.

Army personnel on Taiwan accomplished an unprecedented operation when they moved from the planning stage to initiation of actual construction of tactical missile sites for the *Nike Hercules* system in less than 10 days.

While the Fort Bliss based missile bat-

talion was being alerted for assignment to Taiwan, a hand-picked team of experts in the *Nike Hercules* field flew to the troubled area to select missile sites and provide technical advice for the civilian engineering and contracting firms already on the scene.

The team worked around the clock locating and planning tactical sites on Taiwan and familiarizing both United States Army and Chinese Nationalist Army troops with the capabilities and limitations of the *Nike Hercules* system.

Nationalist Chinese engineer troops using US furnished heavy construction equipment prepared the grounds for two of the missile battery sites. Company C of the US Army's 809th Heavy Construction Battalion furnished advice and assistance to the Nationalist Chinese engineer units. An American construction firm in operation on Taiwan contracted for preparation of the remaining two *Nike* battery sites to assure that the *Hercules* battalion would be operational on 25 October 1958—the deadline date established by Department of the Army.

The efforts of all engineer units and the United States contractor were coordinated and supervised by the Okinawa Engineer District of the Pacific Ocean Division.

During the Taiwan crisis, substantial quantities of United States Army equipment and numerous training teams were furnished the GRC Army under the Military Assistance Program. Included in the modern equipment items provided the Chinese Nationalists was the Amphibious Resupply Cargo Barge (*BARC*) with an accompanying training team to instruct Nationalist troops in operation and maintenance of the amphibious vehicle. Transportation Corps personnel staged an im-

pressive demonstration of capabilities of the versatile and rugged *BARC* at the Tsoying Naval Base for appropriate American and Chinese officers.

Major Objectives of USARPAC Command

Seven important major objectives have been set forth by General White which the USARPAC Command must achieve in peacetime for immediate implementation in the event of hostilities.

These are:

1. To maintain the Eighth United States Army in Korea in a high state of combat readiness.
2. To maintain the 25th Infantry Division in a highly mobile, battle-ready state as a strategic reserve for development in support of Pacific Command plans.
3. To develop and maintain a forward base or bases in the Western Pacific for the continued logistic support of both United States and allied forces in either limited or general war.
4. To maintain nuclear capable units at the highest level of effectiveness.
5. To assist in the development of effective friendly forces in the Pacific Command countries and to integrate their ground forces capabilities with those of the United States Forces.
6. To be prepared to utilize the combat support of the Pacific Air Force, the Pacific Fleet, and units of the Strategic Army Forces from the United States.
7. To participate in combined exercises with friendly countries in the vast Pacific Command area.

The official United States Army photographs accompanying this article portray some of the activities of this highly strategic and important command.



Fort Shafter, Hawaii with USARPAC headquarters to the right of the flagpole



Macomb Gate, main entrance to Schofield Barracks, Hawaii



Above, aerial view of 25th Infantry Division review at Schofield Barracks, Hawaii, with new Capehart units in the background. Below, Tripler US Army Hospital occupies a commanding view on a hillside near Honolulu.





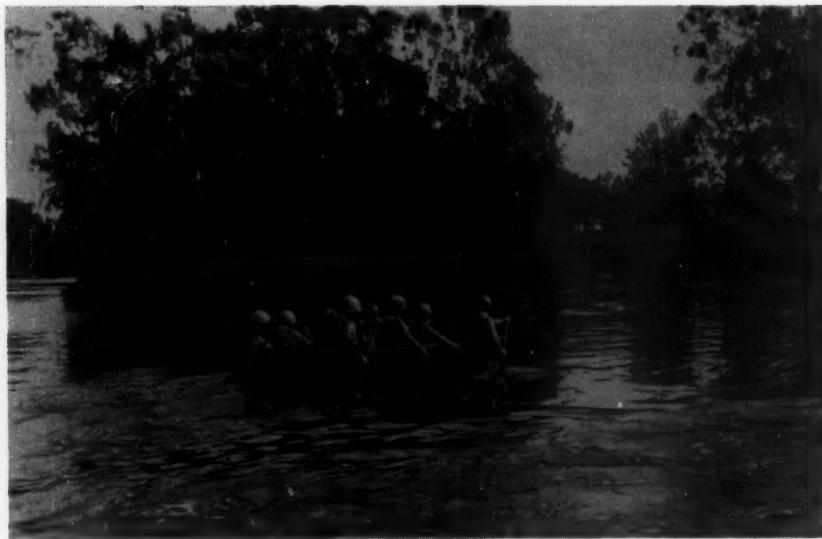
Above, the National Memorial Cemetery of the Pacific with the city of Honolulu in the background. Below left, men of the 25th Infantry Division climb the cargo net in amphibious training. Below right, a team of 25th Division riflemen and *M47* tanks move forward in a battle problem.





Above, tankmen of the 25th Division learn to care for their wounded in tropical training. Below, troops of the 25th Division file aboard a commercial plane for flight to training area at Pohakuloa on the island of Hawaii.



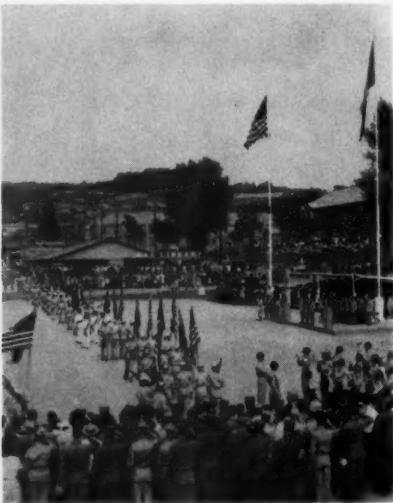


Above, members of the 25th Infantry Division practice river crossing at Wahiawa Reservoir near Schofield Barracks. Below, an *Honest John* rocket is fired from the Army's firing site near Mokuleia on the island of Oahu.





In Japan the US Army raises much of its own food. Above, Japanese women employees of the Army at the US Army-operated Chofu farm in central Honshu. Below left, a cab is lowered onto a chassis and motor in the rebuild shop at the US Army Logistical Depot at Fuchu. Below right, change of command ceremonies at Yongsan, Seoul, Korea, 1 July 1957.





The rebuilt Han River bridge between Seoul and Yong Dong Po, Korea

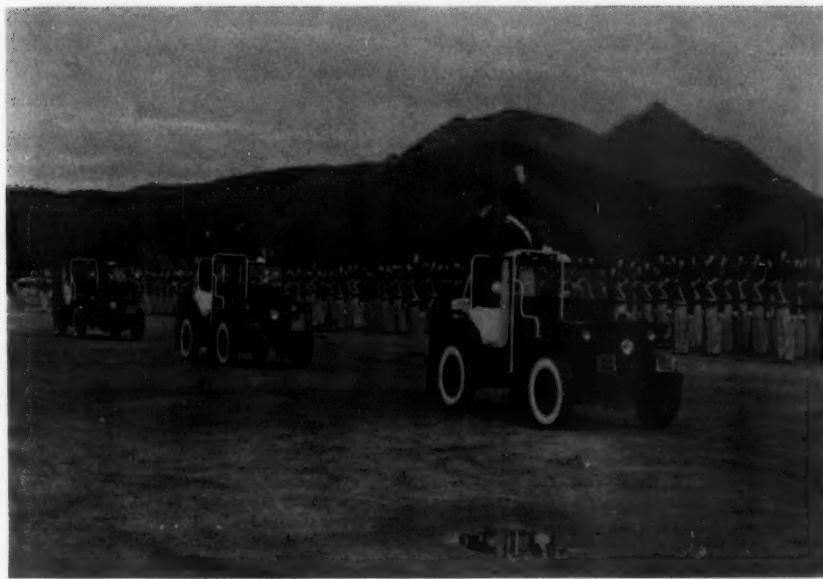


A member of the 1st Cavalry Division in Korea is armed with a 3.5-inch rocket

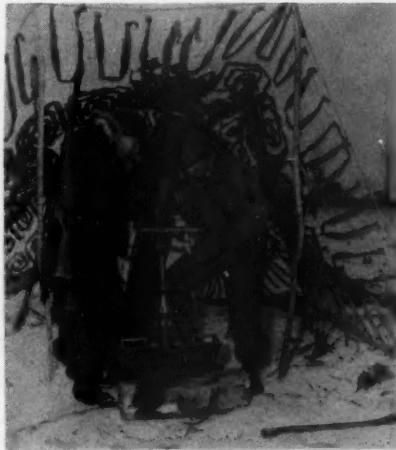


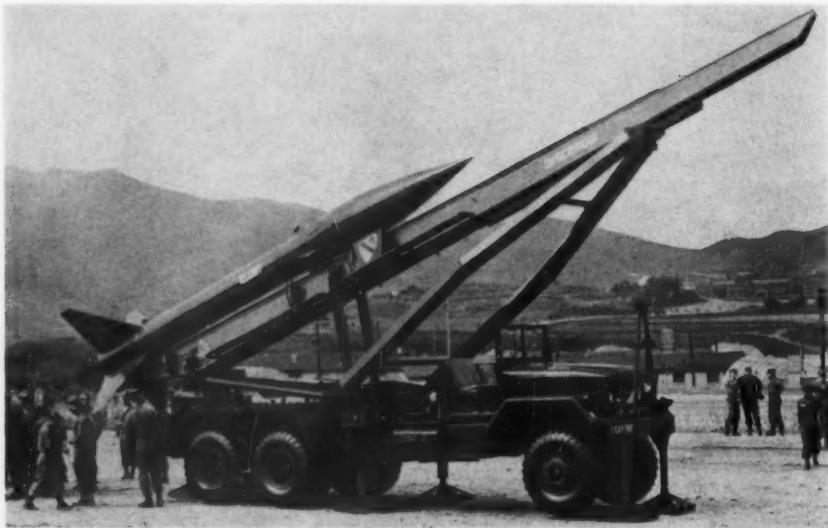
Above, troops of the 33d Republic of Korea Division conduct firing tests under the watchful eyes of Korean and US Army officers. Below, a 280-mm gun being fired during a demonstration of nuclear capable weapons by I Corps Artillery in Korea.



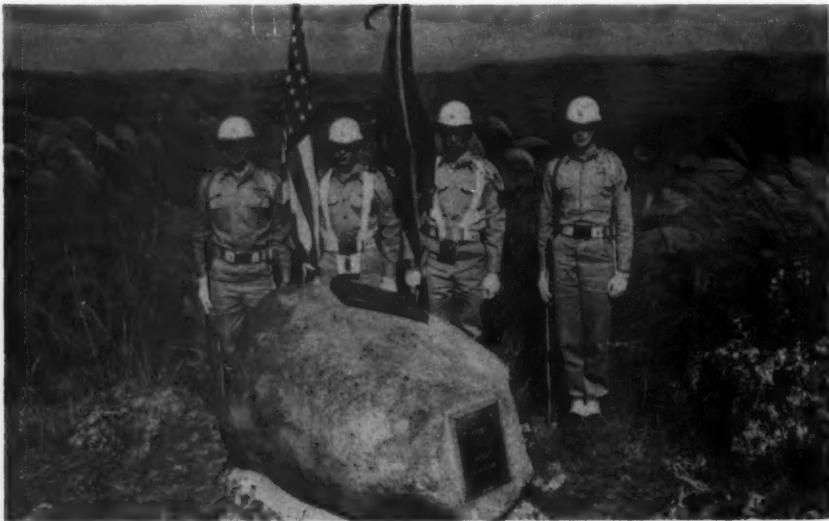


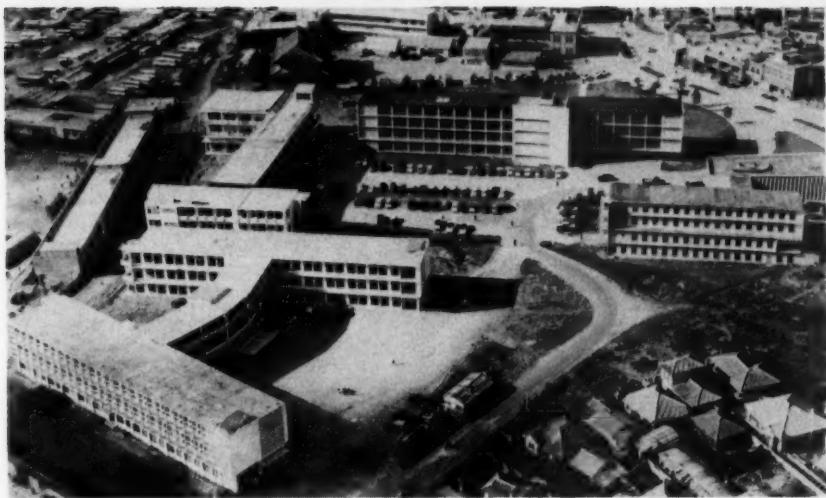
Above, General I. D. White, Commander in Chief, USARPAC (in second jeep), reviews cadets of the "West Point" of Korea. Below left, men of the 7th Infantry Division boarding an *H-21 (Shawnee)* helicopter at an Army airfield in Korea. Below right, a 4.2 mortar crew of the 7th Division Artillery during Operation *Snowflake* in Korea, winter 1958.





Above, cadets of the Republic of Korea military academy are briefed on the *Honest John* rocket by personnel of the 7th Infantry Division Artillery. Below, Lieutenant General Simon B. Buckner, Jr., Memorial located in the southern part of Okinawa.





USCAR Photo

Ryukyu Islands government building expansion and modernization



The 120-mm antiaircraft gun is prepared for firing on Okinawa



Above, a US Army *BARC* approaches the beach during a demonstration staged near the Tsoying Naval Base on Taiwan. Below, a 2½-ton truck loaded with Chinese Nationalist troops debarks from a *BARC* during the demonstration near the Tsoying Naval Base.



Fabian Tactics and Nuclear Weapons

Lieutenant Colonel Louis Caudell, *Infantry* and
Major Keith C. Nusbaum, *Artillery*

This article is in consonance with current tactical doctrine as taught at the United States Army Command and General Staff College.—Editor.

THROUGH disposition of her Armed Forces and repeated public statement of a determination to fight if necessary, the United States has shown her intention to defend the Free World. Seventeen times since the close of World War II, our country has demonstrated that it will react to offensive actions of international communism; and in a number of these cases, US Army forces have participated.

Basically, the role of the Army in this situation is readiness—the constant capability for reaction. How can our Army be expected to react at the outbreak of another war?

Assuming that the free nations of the world will maintain their defensive posture and that Soviet aggression will avoid massive nuclear attack, future moves by the Communists will continue to take the form of more or less limited aggressive action. This action will occur at a time and place of Soviet choice—an overt act initiated against a defensive entity. This extremely basic description of the situation as it is or will be leads to a definition of the problem.

Free World Forces

Free World forces defensively arrayed throughout the world cannot be strong at

all points, particularly at that specific point where the next aggressive Communist act occurs. Forces in the path of the next Communist move must be reinforced. Prior to this reinforcement, however, they must withdraw in front of what will most surely be superior forces. This withdrawal will be planned and executed to avoid destruction and to gain time, while giving up space. During the withdrawal the Free World forces will exact the highest possible price in Communist casualties and equipment for every yard of ground surrendered. After arrival of reinforcements the battle will be aimed at eliminating the threat to the area and the forces attacked. The constant threat of nuclear weapons, or their actual use, will make the type of warfare used very fluid and dispersed. Each force will try to trap the other, form him into a target for his weapons, and having done so, destroy him. Move and countermove, thrust and counter-thrust, assemble, disperse, assemble again for the final blow, then withdraw to look for new targets.

Some thinkers have described ground tactics of the future in terms of naval tactics of another era; perhaps they are not so far from the truth. One thing is definite; in light of the threat of nuclear weapons, no commander will dare concentrate his forces continually. He must keep them dispersed and moving. And this movement implies a back and forth activity of both sides; assault and withdrawal, attack and fall back, delay and attack

The delaying action must be considered in a new and even more important light than ever before if our forces are to weather the initial onslaught of an aggressor attack and live to conduct the decisive offensive

again. The successful commander on this fluid battlefield will have to be the master of all three forms of maneuver—attack, defense, and delay—to win or indeed even to stay alive in such a war.

In light of this appraisal of the probable tactical picture of future warfare, it is necessary to reappraise our tactical training for war as offered today in service schools. This training, founded mainly on past experience, teaches that success in war comes only from seizure and retention of the initiative; that the initiative is held by the attacking force; that defense is adopted to economize forces or to force the attacker to fight on ground which the defender has selected; and that the delaying action is used to trade space for more favorable combat conditions, perhaps to lead the enemy into a trap.

This doctrine remains valid. It is in its application and implication for future war

Lieutenant Colonel Louis Caudell served in Europe with the 26th and 29th Infantry Divisions during World War II. From 1951 to 1953 he was with the 3d Infantry Division in Korea and served as Regimental S3 in Japan and Korea with the 24th Infantry Division. Following his graduation from the Advanced Course of the US Army Infantry School he was Regimental S4 and battalion commander in the 38th Infantry Regiment, 2d Infantry Division, Fort Lewis, Washington. Upon completion of the Regular Course of the U. S. Army Command and General Staff College in 1956, he was assigned to the faculty of the College. He now is with the 3d Armored Division, United States Army Europe.

Major Keith C. Nusbaum was graduated from the US Military Academy in 1945. He served with the 6th Infantry Division in Korea from 1945 to 1947, and the 1st Guided Missile Regiment at the Naval Air Missile Test Center from 1949 to 1951. In 1952 he served in Korea with the 17th Field Artillery Battalion. He was with the Office of the Assistant Chief of Staff for Intelligence, Department of the Army, from 1953 to 1957. After graduation from the U. S. Army Command and General Staff College in 1958, he was assigned to the faculty of the College.

that the importance of each phase—attack, defense, and delay—in relation to the whole battlefield picture must be evaluated. Any such evaluation necessarily will show that the delaying action must be considered in a new and even more important light than ever before.

Historical Examples

Can a real growth of tactics be found in history? Has there really been a trend in the history of withdrawals and delaying actions? Let us look at the record and see.

For over 2,000 years, delaying tactics have been called "Fabian Tactics" after Quintus Fabius Cunctator ("The Delayer") or Ovicula ("The Lamb"), an early Roman Dictator. Fabius, a man in his seventies, was made Dictator of the Roman Republic after the decisive defeat of the Roman legions by Hannibal of Carthage at Lake Trasimeno in 217 B. C. Fabius, realizing that no Roman general was a match for Hannibal, directed his generals to avoid battle, withdraw before Hannibal, and observe three rules. First, they were to hold the high ground. Second, they were to keep the Carthaginians in view. Finally, they were to harass Hannibal's flanks and rear continually, and thereby wear out his army. One of the Roman generals, Varro, a butcher's son, decided to attack Hannibal. His defeat at Cannae in 216 B. C. is synonymous with annihilation. For the next 15 years, Fabian tactics prevented Hannibal from conquering Rome.

Another delaying action of importance is that of Kutusov, the old Russian general who countered Napoleon's invasion of Russia in 1812. Kutusov was fully aware of the French Emperor's ability as a general. In spite of urgings by the czar and the occasional rashness of his subordinates, Kutusov avoided as often as he could the decisive engagement of his whole force. When his forces were decisively engaged, they suffered serious losses. Al-

though Kutusov harassed the enemy, he fought only minor engagements designed to defeat small forces of the French. His goal was to destroy the French piecemeal. His success can be stated statistically; an army of 363,000 Frenchmen entered Russia—95,000 left it as a military force.

World War II

The scenes of two great delaying actions of modern times again are found in Russia—the Soviet withdrawal before the Germans in 1941-42 and the German withdrawal from Russia in 1942-45. It is in the German withdrawal that we can see a marked and clear evolution of delaying tactics, for in this action the attack and the decisive engagement are used often and successfully as a means of delaying the enemy. The Soviet delay of the German forces is marked with tactical blunders, piecemeal commitment of forces, and staggering losses of men and supplies—it serves more as a lesson of what not to do for military students.

It is doubtful whether the German generals really wanted to conduct a delaying action after the failure of their 1942 offensives. It appears that Hitler, through his "inspired" directives to stand or die, forced them to conduct, on the grandest scale in history, a delaying action which was to last for nearly three years.

The initial plan for the invasion of Russia called for the decisive battle of the war to be fought west of the Dnieper, the great river which drains Russia and the Ukraine. However, the initial successes of the invasion so thrilled Hitler that instead of halting on the Dnieper, he pushed his generals alternately on to Moscow and the Caucasus. Both pushes ended with stiff Soviet defenses halting the numerically inferior Germans. The inevitable Soviet counterattack and the ultimate German withdrawal then began.

The generals cautioned Hitler to withdraw when their drives were halted. Hitler's orders were to hold to the last man

and bullet. These orders resulted in local Soviet offensives against the weaker German positions, followed by German counteroffensives which were often strikingly successful on both the tactical and strategic level. These counteroffensive maneuvers badly mauled the Soviet armies and delayed the final Soviet push into Poland for over two years. Field Marshal von Rundstedt is reported to have remarked that as the result of German action in Russia any estimate of Soviet casualties would be wrong by over one million persons, plus or minus.

Regardless of the political motives, or the personalities involved, the great lessons of the German delaying action begun in 1942 and ending in 1945 in Russia are:

- Offensive action is possible in the retrograde.
- The delaying action can destroy large numbers of the enemy with relatively few losses to the withdrawing force.
- The encirclement and destruction of large numbers of the enemy is possible in the delaying action.
- Modern weapons and superior mobility, coupled with good leadership and a will to win, give a delaying force a tremendous destructive ability.

A definite trend toward closer engagement of delaying forces appears to have developed over 2,000 years of military history. This trend implies that offensive action by good troops is possible, even mandatory, if the present-day commander wishes to get the most delay and the most enemy losses from a retrograde movement. This trend seems to follow from the change in weaponry—from swords and spears through muskets and cannon, to tanks and aircraft. What will be the effect of nuclear weapons on this trend?

Impact of Nuclear Weapons

The development of nuclear weapons and their contemplated use on the future battlefield has caused a reevaluation of our

tactical doctrine. Doctrine developed over the years still is valid in nonactive nuclear situations. We must, of course, be prepared to fight under this condition should we become involved in limited or peripheral wars where neither side chooses to use nuclear fires. However, we also must be prepared to adapt our doctrine to an entirely new set of conditions which will be imposed on the battlefield if either or both sides use nuclear weapons.

Our tactical doctrine of delay has not been changed materially by the introduction of nuclear weapons on the battlefield. Some changes, however, are required in the techniques and application of that doctrine. Nuclear weapons now permit the commander of a delaying force to accept risks which in the past would have been unacceptable. This by no means should imply that the commander can "throw caution to the winds." Quite the contrary, the commander still must combine caution and aggressiveness with professional knowledge to execute successfully this type of action. Nuclear weapons, if skillfully employed, can assist him.

Fundamentals

A look at the fundamentals will serve as a basis for further discussion of the effects of nuclear weapons on delay.

Cause maximum attrition of enemy forces.—Irrespective of the reason for engaging in a delaying action, we try to make the enemy pay a high price in casualties. We can, through aggressive delay, cause the relative combat power of opposing forces to become more favorable to us. A delaying action, when skillfully applied, can supplant the defense as a type of warfare best adapted to impose maximum destruction on the enemy with minimum losses to our own forces. Nuclear attacks on profitable targets forward of the delaying position may deplete the enemy forces to the extent that we destroy his attack capability. At least, this should be

our goal. Until recently this was not considered a capability of a delaying force.

Proper utilization of terrain.—Although this fundamental has always been a basic consideration of engaging in any type of tactical action, it was only recently listed as a fundamental of the delaying action. We can see the importance of the proper utilization of terrain when we analyze the military characteristics of terrain. Observation and fields of fire, critical terrain, and avenues of approach will not decrease in importance. Consideration of these characteristics is as important in active nuclear warfare as in nonactive nuclear warfare. However, other characteristics of terrain have taken on added importance.

Cover, including wooded areas, vegetation, and artificial overhead cover, markedly reduces the vulnerability of friendly forces to the thermal effects of nuclear weapons; and overhead cover reduces the effects of all radiation. However, this reduction in vulnerability may be more than offset by the increased vulnerability of forces to the secondary blast effects of nuclear weapons occurring in wooded or built-up areas.

Concealment of friendly forces by artificial and natural means denies the enemy target intelligence, thereby reducing his ability to deliver effective nuclear weapons attacks.

The effective employment of obstacles can materially assist in the accomplishment of the delay mission. Always effective in the past to slow down the enemy advance and to provide flank protection, obstacles have increased in importance. They are now heavily relied on to strengthen the delaying position. Obstacles, properly covered by fires, are the most effective means available to the delaying force to cause the attacker to mass into lucrative nuclear targets. A delaying position, lacking the depth and strength of a defensive position, needs the additional strength afforded by obstacles.

Trade space for more favorable combat conditions.—Space may be used as a weapon by making the enemy fight to gain it. This is predicated on the fact that space is of no value to the delaying commander except for the time that he can gain from it. In trading space, the commander employs obstacles, firepower, and maneuver to make the enemy pay the highest possible price for the ground gained. Nuclear weapons provide the commander a powerful means to assist in gaining additional time and increasing the cost to the enemy. The over-all effect of adequate nuclear support is to gain more time with the sacrifice of less terrain.

Maintain freedom of action.—The use of nuclear weapons by a delaying force facilitates the application of this fundamental by increasing the flexibility of the delaying force. This fundamental was formerly "avoid close combat—maintain freedom of action." We have dropped the "avoid close combat" part of the old statement of the fundamental. It is now possible and perhaps even desirable to have parts of the delaying force become closely engaged. This close combat causes elements of the attacking force to mass into profitable nuclear targets. The increased destruction of the enemy resulting from such action will accomplish the mission more effectively. Nuclear weapons permit the commander to become more closely engaged and still retain the capability of disengaging his forces. Although the commander has nuclear weapons to assist in disengagement of heavily engaged units, he should not allow his entire force to become closely engaged. He must, at all times, retain the capability of disengaging his force and withdrawing to another position. He should never lose his freedom of action.

Detailed centralized plans—decentralized execution.—Although this has always been a fundamental of the delaying action,

its proper application has been emphasized further by conditions of nuclear warfare. Centralized plans ensure the most effective employment of all means including nuclear support by delaying forces. The existence of an enemy nuclear capability further emphasizes the requirement that subordinate commanders be authorized to take decisive, on the spot action in the event of loss of control and communication facilities or the creation of obstacles following a nuclear attack.

Enemy Employment of Nuclear Weapons

Recognizing the tremendous increase in the destructive capability provided by nuclear weapons, an enemy may employ nuclear weapons in all types of operations, but will certainly employ them in offensive operations. He will realize that the full effect of nuclear weapons is gained only when coordinated with nonnuclear fires and exploited by ground attack.

Consideration should be given to the type of offensive combat which may be employed by an expected enemy before discussing countermeasures.

In offensive combat, enemy ground forces will achieve their objectives by advancing their infantry and tanks to close with the friendly force and by the employment of nuclear weapons. These objectives may be either terrain areas or destruction of our forces.

The enemy's concepts of major offensive action on the nuclear battlefield may envision the employment of highly mechanized forces to seize deep terrain objectives rapidly or to surround a hostile force and compress it into a profitable nuclear target. However, before he can commit his mechanized forces in such exploitation, he must first set the stage for exploitation. This will involve either the employment of his infantry in an assault or the employment of his nuclear weapons to break the initial crust of the hostile position.

Once a penetration of the defenses is

made, he is then in a position to surround and isolate units which he can destroy piecemeal. The enemy can be expected to destroy bypassed units by employment of nuclear weapons rather than habitually employing maneuver elements against them. This skillful employment of nuclear weapons permits him to maintain the momentum of his attack and to conserve his fighting units for other tasks.

It can be expected that he will lean very heavily on nuclear weapons to penetrate a deliberately organized defensive area. However, in the fluid warfare of the future battlefield, the dispositions of the forward elements of a delaying force may not present profitable targets for enemy nuclear weapons. Dispersion and prepared positions make the forward elements of a division disposed on a delaying position a poor target. To ensure success of ground exploitation of his nuclear attack, the enemy will have to employ numerous nuclear weapons to produce maximum effect on dispersed and dug-in infantry to permit rapid advance through the delaying position. He will, therefore, focus his attention on reserves which will be the most vulnerable of all units of a delaying force.

Conduct of Delay

Tomorrow's battlefield will be characterized by a rapid transition from one type of combat to another. Thus a defending force may be compelled to withdraw suddenly. The commander of a delaying force may find the situation changed or be able to change it himself to the extent that he can resume the offensive.

One of the methods for delaying the enemy advance is by limited offensive action. The power available in nuclear weapons in conjunction with this offensive action can throw the enemy off balance and slow the momentum of his attack. This increased power permits the commander to employ all types of tactical action in the accomplishment of a delay mission.

Although a decisive battle is not advo-

cated on a delaying position because of the enemy's superiority in strength, maximum destruction of enemy forces is sought. The conflict between these two requirements (maximum destruction versus decisive action) must be compromised to the extent practicable to cause maximum delay. As previously stated, the goal is to destroy the enemy's attack capability.

In a delaying action, nuclear weapons are used to assist in disengagement, cause maximum delay, and to inflict casualties. Nuclear weapons are employed so as to have an immediate effect on the operations of the forward elements.

Enemy forces will present good nuclear targets if forced to mass in front of an obstacle, or in front of a strongly defended position on good terrain. The skillful and timely employment of nuclear weapons will enable the commander to inflict more casualties on the enemy and consequently to gain more delay. A commander with nuclear firepower will permit his forces to become more heavily engaged than otherwise in order to force the enemy to mass and present a profitable target.

Obviously, these two considerations cannot be considered independently. Certainly, forcing the enemy to mass and then striking him with nuclear weapons will affect time and space factors as well as concept of maneuver.

Nuclear weapons may be employed profitably by on-call fires against enemy units in reserve, concentration areas or attack areas to disorganize his attack and to enable us to gain additional delay. They may be employed at defiles through which the enemy must pass to reinforce his attack, or against enemy elements attacking (or about to attack) in order to facilitate disengagement. However, in the latter case, it may not be desirable to follow up the nuclear attack with ground exploitation.

Barriers

Barriers can be created by the employment of atomic demolitions munitions in

underground or surface bursts. Residual radiation will create effective barriers, particularly if used in defiles or restricted areas. There must be a careful selection of ground zero and a reasonably accurate determination of the pattern of militarily significant fallout from these weapons. For targets of great size—such as large earth or concrete dams, port complexes, and large tunnels—demolition by nuclear devices may be more economical, rapid, and certain than by conventional explosives. In such cases as blowing a dam to flood an area or raise a river, the resultant radioactivity enhances the strength of the obstacle. However, hazards created by residual contamination and its effects on non-combatants must be analyzed carefully by the commander.

Usually the policy concerning the use of nuclear demolition and residual radiation on large areas is included in the plans of higher echelons. The use of radioactive contamination in the enemy's rear often is to the advantage of the delaying commander. A delaying force will not hesitate to use this as a means of slowing or stopping an attacker. Normally, the defender will not have to fight to regain the ground covered by the contamination until it has decayed beyond the point where it is militarily significant. This consideration will not apply to the attacker. He must soon cross the ground on which he uses his nuclear weapons. His best interests are served by restricting the use of fallout in the defender's rear areas so as to avoid slowing the speed of his attack.

We can resist on a delaying position sufficiently to force the enemy to mass and then employ nuclear weapons against his forces. Depending on the over-all situation, this action may be followed by disengagement and withdrawal or by ground exploitation and further delay.

Pressure can be exerted on the nose and flanks of a penetration to force the enemy to mass prior to employing nuclear

weapons concurrent with a counterattack.

A gap can be purposely created in the delaying position by allowing one unit to withdraw while other units hold. When the enemy forces are massed in the gap, they can be destroyed by using nuclear weapons in conjunction with a limited offensive action.

On-Call Fires

The commander's concept for the employment of nuclear weapons in a delaying action normally envisages their employment as "on-call" fires. Targets against which the weapons will be used must be anticipated to reduce the time lag between detection and engagement of the target. Planning for anticipated targets is based on an analysis of the situation to determine potential target areas in light of the scheme of maneuver, knowledge of the enemy's tactical doctrine, knowledge of the terrain, and information of the enemy's situation.

These target areas, although presently unoccupied, may become profitable targets upon occupation by the enemy and, therefore, are selected for possible nuclear attack. In a delaying operation, targets are selected whose destruction will immediately affect the operations of forward tactical units, as well as targets that would be engaged to disrupt or delay the enemy advance.

Knowledge of the terrain which he now occupies will enable the commander to determine the localities which the enemy is most likely to use. Having determined these localities, a close study of the characteristics of the area can be made. This knowledge can be used in determining the best method of employment of nuclear weapons, thus adding importance to this "rearward reconnaissance."

Recommended weapons for anticipated targets are based on the general size of the area which the enemy may occupy, on the employment of delivery means, and

the weapons available. In some operations the destruction of troops may not be the sole criterion for the use of these weapons. Cratering and contamination may effectively deny an area or an avenue of approach to an enemy for several days, thus assisting in the accomplishment of the delay mission.

Final decision on the type and yield of weapon to be employed and the desired ground zero will be based on a final analysis of the *actual* target considered in light of:

- Mission and importance of target.
- Availability of nuclear weapons.
- Capability of delivery means.
- Location of the target.
- Nature of the target.
- Predicted condition of the target after burst.

The staff must analyze the area of operation and continually select probable future targets for nuclear fires.

Mobility

In the conduct of operations, situations must be avoided which require massing of forces. Because of comparative strengths, loss of a large number of friendly troops would have a much greater effect on our capabilities than similar losses on those of the attacking enemy. This factor then indicates that our plan for operations must capitalize on *mobility* to present a minimum of profitable targets for the enemy's nuclear weapons. It is desirable that the mobility of the delaying force be equal to or greater than that of the enemy. Actually, a basic advantage belongs to the delaying commander in his control of routes and his detailed knowledge of terrain, especially the roads and obstacles. His ability to deny routes and to place obstacles in front of an advancing enemy will give him an advantage in mobility, even though the enemy has superiority in transport.

The reserves in a delaying action are

most vulnerable to the enemy's nuclear attack. They must be dispersed to prevent presenting a profitable target to the enemy. Nevertheless, their dispositions must be such as will accomplish the mission. Close coordination and command supervision during the conduct of a delaying operation will prevent the unwarranted massing of troops in assembly areas or entrucking areas.

Conclusions

Even a quick look at the posture of the Free World's military force shows that initially the role of our Army will be to delay aggression. In over 2,000 years of recorded history, a trend in delaying tactics toward more use of offensive action is clearly demonstrable. The tactical doctrine for the delaying action which was developed for nonactive nuclear conditions still is valid on the nuclear battlefield provided there are modifications in the techniques and their application.

The commander should employ nuclear weapons with great care and consideration to gain full benefit from them in support of his mission. Nuclear attack of a dense enemy concentration *without ground exploitation* is consistent with a delaying mission. Areas which by their nature may become profitable targets upon occupation by the enemy are selected for planned nuclear fires. Many enemy formations will present themselves as profitable nuclear targets for relatively short periods of time. To discover and attack such targets requires that the time between the discovery and the nuclear attack be reduced to a minimum.

Nuclear weapons will permit the commander to become more closely engaged with the enemy, thereby forcing the enemy to mass as a nuclear target. The delaying force must be highly mobile to permit it to disperse to avoid nuclear disaster and to concentrate at the decisive time, retain the concentration for the necessary period, and disperse again.

MIKHAIL FRUNZE AND THE SOVIET ARMY

Benson Lee Grayson

ON 3 November 1925 a great funeral was held in Moscow's Red Square. Under the gray winter sky, approximately 250,000 Russian citizens stood waiting in the snow, assembled by the Soviet Government as proof of national mourning in the greatest such demonstration since the death of Lenin, about 21 months before. Joseph Stalin, nominally only the obscure Secretary General of the Communist Party, but already well on his way toward becoming absolute dictator of the Soviet Union, stepped forward to deliver the funeral oration. This was the first time Stalin was to speak from the platform atop Lenin's tomb; the nation was already wracked by the desperate struggle for power begun even before Lenin's death by his associates; and the grim scene provided an ominous foreshadowing of the ruthless terror that was to follow in the years ahead.

"The Communist Party," Stalin said, "mourns the loss of a most loyal and devoted member; the Soviet Government mourns the loss of a daring and efficient servant; the Red Army mourns the loss of a fearless and popular chief."

The subject of this eulogy was Mikhail Vasilevich Frunze, until his sudden and unexpected death Soviet Commissar for War and, so far as may be ascertained, next to Stalin the most powerful man in the Soviet Union. At the time of his death, Frunze was acclaimed by the Soviets as one of the earliest of the Bolshevik revolutionaries, but it was as a military com-

mander and theoretician that he won his greatest renown.

Today, Frunze still is regarded in the Soviet Union as one of the most brilliant Communist military writers, a reputation that has not been diminished during the frequent rewriting of official Soviet history, and his works continue to be studied in the higher Soviet military schools. Unfortunately, no biography or anthology of Frunze's writings has ever been published in English. Certainly his career is an important as well as one of the most interesting episodes to be found in Russian military history.

Early Life

Frunze was born in 1885 in the small town of Pishpek (later renamed Frunze in his honor) in what is now the Kirgiz Republic of the Soviet Union. Of Moldavian ancestry, Frunze's father had settled in the area after serving as a medical corpsman in the Imperial Russian Army. Frunze attended the local municipal school, and then went to the government higher secondary school in Vernyi (Alma-Ata), graduating with honors in 1901. This was more than the average amount of schooling attained by a young man of Frunze's background, but he continued his studies further, attending the St. Petersburg Polytechnic Institute. There, he was drawn into the revolutionary movement, becoming a member of the Russian Social Democratic Party in 1904. When the split within the Russian Social Democratic Party into Menshevik and Bolshevik factions hard-

A military writer of note, and at the height of his career one of the most powerful men in the Soviet Union, Mikhail Vasilevich Frunze's writings continue to be studied in the higher Soviet military schools

ened into a permanent division, Frunze elected to follow Lenin's Bolshevik wing, unlike his future superior in the Red Army, Leon Trotsky, who sided with the Mensheviks.

After the start of the Russo-Japanese War in February 1904, Frunze left his studies to become a full-time Bolshevik revolutionary, taking part in the December 1905 rebellion of workers in Moscow. In March 1907 he came into prominence for his activities in organizing a strike of textile workers at Ivanovo Voznesensk, near Moscow. Arrested after armed resistance and sentenced to four years' hard labor in Siberia, Frunze led a revolt of prisoners there and was condemned to be executed.

The Czarist Government, however, was often surprisingly lenient in its punishment of the revolutionaries and, after a mob of 10,000 workers demonstrated in protest against the sentence, Frunze's punishment was reduced to life imprisonment at hard labor. It is interesting to speculate what Russia's fate would have been had Lenin, Stalin, and Trotsky all been executed, rather than being assigned to relatively mild exile in Siberia. In 1915 the sentence was reduced further and Frunze was released from prison, being exiled to the remote town of Verkhoyansk in Siberia.

No sooner was he released than Frunze resumed his revolutionary activities, at the same time editing an underground

newspaper. Arrested again, he succeeded in escaping, subsequently joining the Imperial Army where he took the opportunity to distribute pacifist literature among the troops. Following the fall of the czar and the establishment of the moderate Russian Provisional Government in February 1917, Frunze became, simultaneously, a member of the executive committee of the Minsk area government, a member of the front committee of the army of the Western Front, and commander of the army of the Minsk area. In his previous career Frunze had shown himself to be a skillful agitator and revolutionary. Now, he was to prove to be a brilliant military commander, organizer, and strategist.

In September 1917 Frunze returned to the town of Ivanovo Voznesensk where 10 years before he had taken the lead in organizing a strike. Forming the Communist oriented workers into a trained and disciplined military force, in November 1917 Frunze advanced at the head of an army of 2,000 men upon Moscow. The Bolshevik revolt against the Provisional Government had erupted first in the capital of Petrograd, spreading from there to Moscow and the other major cities. In Moscow, however, the Bolsheviks found themselves facing effective resistance, and for a few days it appeared as though the revolt, in that city at least, might be put down. Frunze's troops played an important part in the bitter street fighting in which the Bolsheviks finally won control of Moscow, Frunze personally leading the forces that stormed the Kremlin.

Appointed Commissar

Occupied for almost a year with party work, Frunze was appointed in September 1918 to the post of commissar of the Yaroslavl military district. The Red Army had been officially organized on 28 January 1918 with Leon Trotsky, whose performance as the first Soviet Commissar

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for Foreign Affairs had not been overly brilliant, now acting in a much more skillful manner as Commissar for War. The Russian civil war was then increasing in tempo and the Soviet Government, suffering from a shortage of reliable trained personnel, was forced to employ former Czarist officers to command the greater part of its military units. In these cases, trusted Bolsheviks such as Frunze were appointed as military commissar of the unit to watch over the loyalty of the men in general, and over that of the commanding officer in particular.

The policy of utilizing the services of former Czarist officers, often under the threat of force, was strongly urged by Trotsky who insisted that a background of membership in the Bolshevik Party was no substitute for professional military experience. Although Trotsky's position on this matter was accepted under the pressure of the civil war, it was, nevertheless, galling to many of the old Bolsheviks, and it was one of the arguments used against Trotsky in defeating his bid for leadership during the struggle for power in the party to determine Lenin's heir.

Unlike the majority of party officials who were appointed military commissars, Frunze demonstrated a quick grasp of military tactics. After a skillful performance in organizing and training new units for the Red Army, Frunze was named by the party's Central Committee to the post of commanding officer of the Fourth Army opposing the forces of Admiral Kolchak on the Eastern Front. Decisively defeating Kolchak at the battle of Buzuluk, Frunze was sent next to Turkistan where he expelled the Emir of Bukhara and ruthlessly established Soviet control over the area. Frunze's reputation for ruthlessness (he was well-known in the Red Army for executing large numbers of captured officers) was, moreover, earned during a struggle in which brutality was the rule rather than the exception.

Success at Perekop

Rapidly winning recognition as one of the best of the Soviet commanders, Frunze was sent in the fall of 1920 to oppose Baron Wrangel's army advancing northward from its base in the Crimea. Frunze's defeat of Wrangel at Perekop was the last major engagement of the civil war, with the latter's forces withdrawing back to the Crimea to be evacuated by the French Fleet. The end of the Russian civil war was followed by continuing local unrest, and in 1921 Frunze was named War Minister of the Ukraine with orders to put down the widespread guerrilla uprisings.

Wounded twice during the course of the campaign, Frunze carried out the operation with his customary efficiency and ruthlessness, suppressing the uprising in blood. In 1922 Frunze was rewarded for his victories by being named to his first important party post—membership on the powerful party central committee—and was sent as special envoy to Turkey, where he negotiated successfully a Soviet-Turkish agreement with Kemal Atatürk's new government.

The period between 1922 and 1924, in which the bulk of Frunze's military writings were completed, saw also the bitter struggle to eliminate Trotsky's control of the Soviet armed forces in order to defeat his succeeding to the leadership of the Communist Party, and thus of the Soviet state. Lenin had been a semi-invalid since being wounded by a would-be assassin in 1922, and the still little-known Stalin had joined with two of the most important party leaders and closest associates of Lenin—Grigori Zinoviev and Lev Kamenev—in working to thwart Trotsky's accession to power in the advent of Lenin's death.

Frunze was not among Trotsky's supporters, although he was by no means one of the members of the Zinoviev-Kamenev-Stalin faction. Rather, he belonged to a

middle group—those who, while opposing Trotsky's designation as Lenin's heir, urged as a compromise the establishment of a collective leadership somewhat similar to that which existed temporarily in the Soviet Union between the death of Stalin in 1953 and the rise to power of Khrushchev in 1955.

Criticism of Trotsky

Frunze, in his writings, took the lead in criticizing Trotsky's military theories. Trotsky, as Commissar for War, argued that military science was a pragmatic system of rational procedures, based on experience and evolved over the course of history, which remained constant despite the emergence of the Soviet Union. Frunze, on the other hand, insisted that the new proletarian Communist state required the development of a new system of military science based on Marxist ideology. On less theoretical matters, Frunze advocated reorganizing the Soviet Army on a territorial basis to establish Soviet authority over the rural areas (the Soviet Army actually was reorganized on a mixed regular and territorial basis lasting until the late 1930's).

More interesting to the modern reader than these conflicts over outmoded concepts are other of Frunze's military writings. Frunze published several articles on the political and military position of the French in Morocco, displaying a detailed knowledge of the area. Frunze wrote, moreover, what is probably one of the most naked statements of Soviet intentions in regard to the non-Communist world ever made by a Soviet official. "Between our proletarian state and the entire remaining bourgeois world," wrote Frunze, "there can exist only one condition—long, unending war to the death."

Frunze's polemic with Trotsky, like so many of the theoretical disputes engaged in by rival Communist groups, was settled on the basis of the power position of the parties involved, rather than on the merit

of the arguments. Following Lenin's death in January 1924, Stalin, Zinoviev, and Kamenev quickly moved to seize the reins of power. In April 1924, three months later, Frunze was installed as number two man in the Defense Ministry, becoming Deputy Chairman of the Revolutionary Military Council and Deputy Commissar for War. Nominally, this step was taken because of a supposed Trotsky illness; in fact, it represented a clear move first to weaken and then entirely eliminate Trotsky's control over the Soviet armed forces.

Trotsky Replaced

Throughout the remainder of the year, Trotsky's opponents consolidated their hold on the positions of power in the Soviet state, a process made even easier by Trotsky's mystifying refusal seriously to contest his rivals' moves. On 19 January 1925 Trotsky was relieved of his post as Chairman of the Revolutionary Military Council, and 11 days later the party central committee announced Trotsky's dismissal as Commissar for War, with Frunze as his replacement.

At the same time another extremely important event took place, although it was not then so regarded. Kliment Voroshilov, currently the titular President of the Soviet Union and at the time known as one of Stalin's closest supporters, was named to the key post of commander of the Moscow military district. Stalin had collaborated with Zinoviev and Kamenev to defeat Trotsky; he was not about to turn on his two associates to gain absolute power for himself. Frunze, however, occupied the powerful post of Commissar for War, and Frunze could by no means be included among the loyal followers of Stalin. The events that followed read like a detective story; isolated events which, when pieced together, seem to indicate a plot against Frunze's life—a plot rivaling in its intricacy the delicate machinations with which the Borgias and Medicis disposed of their opponents.

In August 1925 Frunze was in the field supervising army maneuvers near Minsk when he received a telegram from Moscow requesting his immediate return to the capital because of increasing Soviet-Japanese tension in the Far East. The special train carrying Frunze back to Moscow was damaged seriously by a time bomb placed under the railroad tracks, a bomb which, had the fuze not been poorly timed, would have exploded under the front car carrying Frunze, rather than under the fifth car. This attack on Frunze's train is not in itself conclusive evidence of a plot against his life—there still was considerable guerrilla activity within the Soviet Union despite the fact that the civil war had ended over four years before—but it does seem significant in the light of later events.

On 31 October 1925 it was suddenly announced in Moscow that Frunze was dead, having succumbed unexpectedly following an operation. Rumors emanating from Warsaw were to the effect that Frunze had been poisoned by Stalin, although this, of course, was routine after the death of any important Soviet official. At the impressive state funeral for Frunze that took place on 3 November, Stalin took pains to express his deep regret at the loss of so brilliant a colleague. Nevertheless, a dispassionate observer might have concluded that Frunze's opportune removal from the control of the Soviet armed forces greatly facilitated Stalin's victory in his struggle with Zinoviev and Kamenev, particularly so since Frunze's successor as Commissar for War was none other than Kliment Voroshilov. From this moment on the position the Soviet armed forces would take in regard to Stalin's drive to power was no longer in doubt.

A curious sequel to Frunze's death occurred the following year. Boris Pilnyak, a well-known Soviet author and poet, in

1926 published a book entitled *The Tale of an Unextinguished Moon*, whose plot bore a remarkable resemblance to the rumors current about Frunze's death. These rumors suggested that Stalin had forced Frunze to undergo the operation knowing that his weak heart would seriously lessen Frunze's chances to survive the surgery. Similarly, Pilnyak's novel dealt with a Soviet Army officer who is killed by doctors obeying the instructions of a party official resembling Stalin. Understandably, Pilnyak's book created a sensation when it was released. The author was forced by the authorities to confess his error in writing the work and all copies of it were seized. Pilnyak finally was liquidated during the purges in 1937, although he was, significantly, posthumously rehabilitated in 1957 following Khrushchev's downgrading of Stalin in the Soviet Union.

Conclusion

Today, more than 30 years later, the mystery surrounding Frunze's death has never been satisfactorily explained. Whether he was eliminated by Stalin as one of the steps necessary to assure the latter's assumption of power, or alternatively, succumbed naturally during the course of a routine operation, is a matter of curiosity rather than of acute national interest at the present time. Although Frunze still is regarded in the Soviet Union as one of its foremost military theoreticians, the great majority of his writings have been outdated by the passage of time, and are now only of historical interest. Perhaps the most significant work left behind by Frunze is his clear statement of unending Soviet hostility to the Western World. Certainly, with Frunze's threat in mind, there is little excuse for the world to be unaware of the ultimate intentions of the leaders of the Soviet Union.

ARSENAL OF KNOWLEDGE

The USA CGSC Archives and Library

Captain Edwin A. Dayton, *Adjutant General's Corps* and
Miss Ava D. Headley

Books must follow sciences, and not sciences books.

—Francis Bacon

FRANCIS Bacon lived at a time when the wooden handpress laboriously turned out books which were beyond the financial reach of most people. In his day, the turn of the 17th century, libraries were almost nonexistent and books were less a guidepost to the future than a newly conceived repository of the past. While Bacon's quote above is still a basic truth, even he probably would be amazed to see that books and documents have become not only a source of knowledge of history past, but also of history in the making and even history to be. They are an essential part of the progress of this age.

During the last two years a series of *Military Review* articles has explained how the College has met the challenge of keeping pace with the future in peace and war. But keeping pace in an era of change and rapid advance would be difficult, if not impossible, without a collateral effort to acquire, organize, and distribute information pertaining to the military art and science. This is the broad mission of the United States Army Command and General Staff College Archives and Library which are vast storehouses of facts and ideas—the weapons of knowledge that are

so vital to the development and to the teaching of modern doctrine and challenging new concepts at the College.

An Active Role

“Putting Knowledge to Work”—the slogan of the Special Libraries Association—is particularly applicable to the functions of the USA CGSC Archives and Library. At first thought it may seem fairly simple for a library staff to acquire Government documents pertaining to defense and the usual materials of a library—books, newspapers, and periodicals. But the primary function of a library with a special mission is to *pass on to the users* important information necessary in their work. This is an *active* function, rather than a *passive* one, and so for the library services acquiring material is only the *first* step in the involved process of making it useful.

Within the broad mission of acquiring, organizing, and distributing information pertaining to the military profession, the primary task of the Archives and Library is to provide reference and reading service for the staff, faculty, and student body of the College and to serve as a store-

The Library Services of the USA CGSC are dedicated to assisting military leaders to keep abreast of today's rapid progress, and to prepare to exploit the doctrine, concepts, and weapons of the future

house of information to keep patrons up to date in the broader fields of culture and science with which the forward-looking officer must keep abreast.

Major General Lionel C. McGarr, Commandant of the USA CGSC, recognized and emphasized the important role of the Library in his guidelines for the preparation of the 1959/60 course of instruction. He enjoined the staff and faculty to encourage ". . . greater student use of the Library and of independent study and research, suitably exploiting the increased facilities and convenience of the Library and Archives in the new academic building."

Keeping Pace

A good library needs three things: a large stock of books and other reference material, adequate facilities, and a trained and interested staff. The USA CGSC Library Services have all three.

With more than 31,000 items flowing

Captain Edwin A. Dayton entered the military service from New York in 1942 and served until December 1945. He returned to active duty in September 1948 and was assigned to recruiting duty in New York and Westchester County. Recalled to active duty as a first lieutenant in November 1951, he served at Fort Dix until 1953, and was Postal Officer for Headquarters, Allied Forces Central Europe, at Fontainebleau, France, until 1957. A graduate of the Adjutant General Recruiting Course (1950); Company Officers' Course (1952); and the Postal Officers' Course (1953) of the Adjutant General's School, he was assigned to the U. S. Army Command and General Staff College as Library Officer in 1957.

Miss Ava D. Headley attended school and worked in the West Virginia public school system prior to World War II. She enlisted in the Women's Army Corps in 1944 and the same year was assigned to the U. S. Army Command and General Staff College. Separated from the service in 1946 at Fort Leavenworth, she remained to accept a Library Services position with the College where she has been employed since that time, advancing to the position of Chief Archivist.

into the Library every year to be catalogued, recorded, filed, and made ready for use should the need arise, the problem of keeping up to date is a monumental one. It is as though Lewis Carroll's Alice was referring to the USA CGSC Library Service when she said, "Now, *here*, you see, it takes all the running you can do to keep in the same place." But the library service must do more than just stay in one place. It must move ahead. And it accomplishes this formidable task almost as a matter of course, for like the rest of the U. S. Army Command and General Staff College, the library service is tightly geared to progress.

Material Is Varied

What special knowledge is the military student or instructor seeking? Is he interested in biography? Shelf after shelf of books are at his fingertips to provide him with dozens of viewpoints on the lives of practically any military or nonmilitary personage.

Is he curious about a specific battle? The Library and Archives are replete with official and unofficial records dating back to the creation of the United States and the years before that event.

Is his question one on new developments? The reading room in the Archives presents virtually all of the latest published and unpublished documentation (both classified and unclassified) of the results of current research and development.

Available to the patron is much material covering fields such as the military arts and sciences, social sciences, technology, and almost every other aspect of contemporary or historical events that could in any way interest the military reader. The Library holdings of 80,000 books, periodicals, newspapers, and reference works comprise a wide selection of primary materials on American military past, present, and future. The collection is supplemented continually by acquisi-

tion of the latest works relevant to the mission and curriculum of the College, with thousands of items of lasting interest added each year. Incidentally, faculty members and students assist in the development of the collection by recommending items for acquisition.

Irreplaceable Records

A major factor in keeping the using military patron abreast of the times and

lations, intelligence surveys and maps, and research and development reports. In the Archives reference room existing doctrine and contemporary thought are carefully and meticulously catalogued, awaiting the hands of the studious researcher and the curious reader alike. The Archives provides US Army administrative and operational documents, and training and technical publications shelved with proposed field manuals, circulars, and ta-



Invaluable to any staff and faculty member who is working on a study or preparing resident or nonresident instruction is ready access to material which backs up his research and which can provide him with illustrations. Thousands of pieces of visual and written information are stored in these voluminous drum files in the still picture and pamphlet room of the U. S. Army Command and General Staff College Archives.

developments is the Archives—a central repository for all types of material. Established during World War II, its holdings today include valuable and irreplaceable records of the Armed Forces and other governmental agencies, war records and reports of military units, foreign governmental and military documents, trans-

bles of organization. Within this area can be found virtually any existing or proposed doctrine, a fact appreciated by the researcher who wants to make use of the latest concept or doctrine on any military subject.

The Archives maintains in permanent files reports of College research, organi-

zational developments, curriculum planning, schedule of classes, student rosters, and a complete file of all instructional material prepared at the College. A large number of current still pictures are retained, and the authority files contain a complete collection of orders, regulations, field and technical manuals, and organizational papers issued by the US Army as well as by other military agencies. These

ing intelligence, guided missiles, nuclear weapons, operations research, troop data, and research and development in general. Proposed military characteristics for weapons and equipment, project cards for US Army, US Navy, and US Air Force research and development, descriptions of military aircraft, combat development study directives and studies, user test reports, materiel control studies, and re-



Highly important to a military college such as the USA CGSC is its collection of official directives, policies, guidances, and other professional material. Here is the well-stocked Department of the Army authority files section of the USA CGSC Archives.

materials, numbering more than 200,000 items, include both classified and unclassified information.

"What Is New?"

The answer to the question "What Is New?" can be found by surveying the new documents which are placed in the Archives reading room within 72 hours after receipt. These materials are arranged by subject matter on special display tables. There are tables for information concern-

ports of exercises and troop tests are a few more of the many sources of information found on the reading tables.

Surveys of areas of the world are arranged alphabetically by country title in the reference area. Almost every situation used in instruction at the College requires careful study of terrain and other critical factors for the situation to be portrayed. Previous and related instructional subjects are kept in the "USA CGSC

Room." Consultation of these files provides the author-instructor much valuable information.

Optimum Facilities

The second requirement for a good library is a suitable location. The new location and facilities of the USA CGSC Library are outstanding. The library services are housed in large, well-lighted quarters centrally located in J. Franklin Bell Hall—the new academic building which

facilities, is in a completely secure area on the third floor. Here, readily accessible to students and to staff and faculty, is a great collection of thousands of military books and records carefully catalogued to give the student and the author-instructor a wealth of information on virtually every subject in the military field.

The Key Is Service

The third requirement for a good library is a trained and interested staff. A



There is a constant air of concentrated study in the Archives reading room where students and author-instructors prepare for future classes with a wealth of valuable reference material close at hand

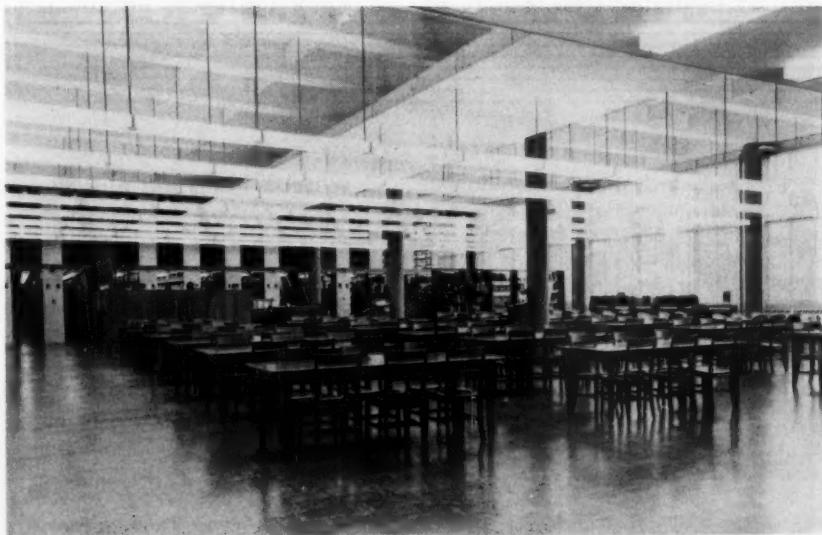
was occupied at the beginning of this year—and utilize most of two floors in a center wing connecting the staff and faculty and classroom wings. The Library with its book stacks, reading room, reference files, and conference rooms is on the second floor and the Archives, with similar

special library like that of the United States Army Command and General Staff College would be of limited use, if not chaotic, without such a staff. A staff of 18 persons is in constant attendance to serve the needs of the researching student or instructor. The skill of these individ-

uals is important because the far-reaching shelves of books and reference material present a formidable obstacle to the time-conscious student or author-instructor. The student preparing a thesis or the instructor writing a subject which soon will be presented from the platforms in the classrooms finds here a ready and helping hand, a quick grasp of his problems, and

Worldwide Help

The personnel of the Archives and Library of the United States Army Command and General Staff College may be assigned to a local organization, but their service is worldwide. For better local service, and to permit others than those actually stationed at Fort Leavenworth to share in the use of the tremendous volume



This is the main reading room of the USA CGSC Library. Tall north windows and numerous fixtures provide excellent light throughout the study area. At the back of the reading room are the card catalogues and the circulation desk and beyond is the huge stack area which stretches upward two stories, providing space for years of expansion. Not shown are small conference or study rooms which extend along the left wall.

a sure knowledge of where to find the material he needs.

Each month the library services circulate more than 2,000 books and approximately 16,000 other items for office, classroom, or home use. Approximately 10 times that number are picked from the shelves for reference work within the reading areas and conference rooms of the Library.

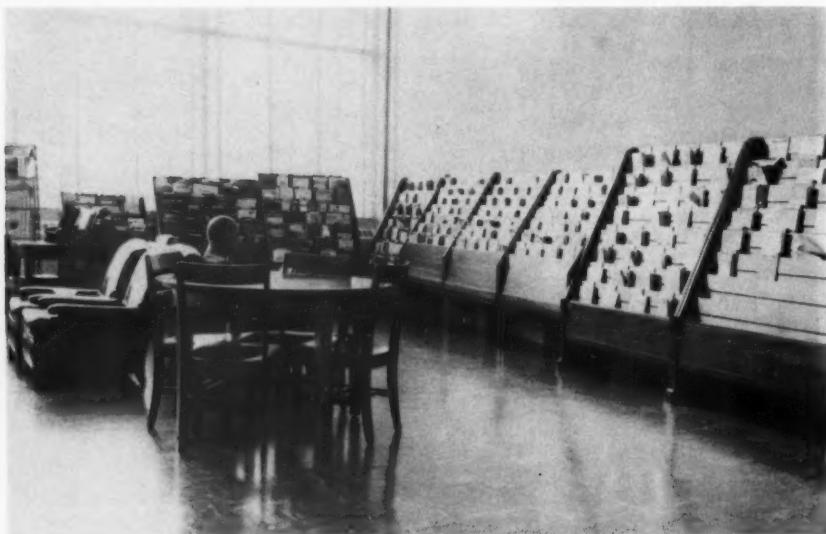
of source material, the USA CGSC Library Services participate in the US-wide interlibrary loan system which includes practically every other similar facility within the Nation.

United States students in foreign staff colleges in Spain, Canada, Australia, France, Great Britain, Pakistan, Italy, Brazil, India, West Germany, and Greece have made the USA CGSC Library Serv-

ices their regular source of information. Army officers in civilian schools within the United States also are regular correspondents. The books and documents are available on a loan basis to all governmental agencies wherever they may be, from local research centers to such comparatively remote installations as US governmental outposts in the jungle areas of Southeast Asia. To ensure that these agencies are

today's rapid progress, and prepare to exploit fully the doctrine, concepts, and weapons of the future. And as the College moves forward, so must the library services, by discriminately preserving what is old and adding what is new.

Francis Bacon recorded in his essay "Of Studies": *Reading maketh a full man, conference a ready man, and writing an exact man.* The reading, the writing, and



The current periodical area of the main Library provides a quiet spot where those interested may keep up to date by reading the latest technical and nontechnical publications

kept current on what is available for their use, lists of new material acquired are circulated periodically to many of them.

Keep the Old and Add the New

Such are the mission, material, personnel, and functions of the USA CGSC Archives and Library—activities which must acquire, organize, and make useful the literature of interest to the military—an endeavor dedicated to the goal of helping the military leaders of the future avoid the mistakes of the past, keep abreast of

the conferences at the USA CGSC inevitably utilize information from the Library and the Archives, and the results of these activities just as inevitably channel back in to the Library to be catalogued and filed for future use.

It was Bacon who also remarked that *Knowledge is power*, and the United States Army Command and General Staff College is striving to use to the maximum the extensive power of knowledge available in its Library and Archives.

MILITARY NOTES

AROUND THE WORLD

UNITED STATES

'M60' Tank Goes Into Production

The *M60* diesel-powered tank (MR, Jun 1959, p 75) has gone into production with an initial contract for the manufacture of 180 vehicles. The primary weapon for the *M60* is a British-developed 105-mm gun without gyroscope.

Of significant advantage is the 250- to 260-mile cruising range attributed to this vehicle in contrast to the 150-mile range of the *M48A2 Patton* which it will replace.

—News item.

Miniature Radar Set

A radar set designated the *SWAMI* (standing wave area motion indicator) and capable of being miniaturized to a weight of about three and one-half pounds has been offered for military use. The sensing device of the *SWAMI* is a sealed vacuum tube envelope containing an ultra-high frequency oscillator pulsed at a low frequency repetition rate. Any movement or intrusion into the area surveyed by the device will effect a change in the repetition rate and will, in turn, be detected by a frequency modulation (FM) detector.

The manufacturer states that the device can be adapted for mounting in a soldier's helmet. Primary application appears to be in the field of physical security and battlefield surveillance.—News item.

'Polaris' Submarine Launched

The *George Washington*, the first ballistic missile submarine specifically designed for firing the 1,200-mile-range *Polaris* nuclear missile from below the ocean surface, has been launched. The 6,700-ton, nuclear-powered *George Washington* is the first of five such vessels equipped with 16 tubes to house the *Polaris* missile and with the same general hull configuration and nuclear reactor design as the pioneer nuclear-powered submarine *Nautilus*, although the new vessels will be almost double the hull size.

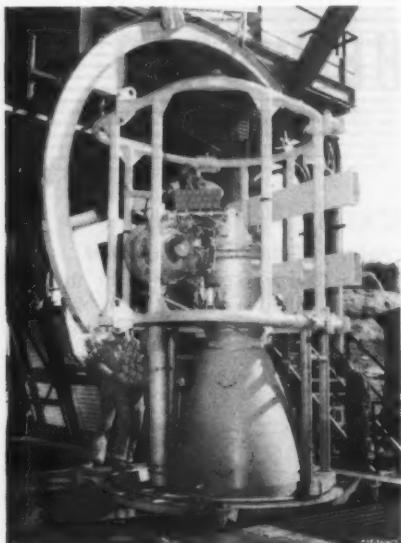
The sixth ballistic missile vessel to join the fleet, to be named the *Ethan Allen*, will have the *Skipjack* hull design, providing higher speed, deeper diving capabilities, and improved maneuvering features.—News item.

Nuclear Propulsion For Rockets

The Atomic Energy Commission has announced the testing of a nuclear rocket engine designated the *Kiwi-A*. The unofficially stated objective of the test was to determine the feasibility of nuclear propulsion for a space vehicle. The *Kiwi-A* is reported to employ a gas jet, generated by heating hydrogen in a nuclear reactor and expelling it through a nozzle, to obtain its thrust.—News item.

ABMA Develops 'Saturn' Engine

The Army Ballistic Missile Agency (ABMA), operating under the authority of the Advanced Research Projects Agency (ARPA), currently is engaged in the development of a 1,500,000-pound thrust en-



The *H-1* liquid propellant rocket engine shown on static test stand

gine as a first stage booster for ARPA's *Saturn* space vehicle. The engine is a cluster of eight *H-1* liquid propellant rocket motors. These motors are a compact and simplified version of the successful *Thor* and *Jupiter* IRBM engine. The giant booster will stand 75 feet tall and have a diameter of 22 feet. It will be combined with two or three additional stages to form the complete *Saturn* space vehicle system.

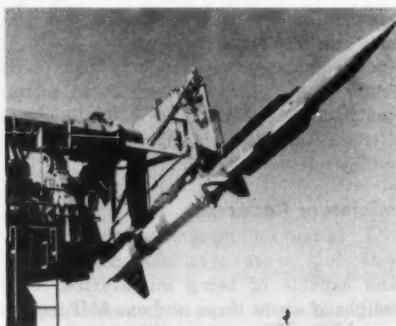
The objective of Project *Saturn* is to provide an efficient system for lifting multi-ton loads into orbit around the earth or deep into space in the 1962-63 time-frame.—News item.

Space Probes

The National Aeronautics and Space Administration (NASA) is reported to be planning 17 satellite launchings and 11 rocket shots at the moon and into space during the next two and one-half years. These shots are among a total of 47 scheduled by NASA during that period.—News item.

Improved 'Terrier' Missile

An improved version of the Navy's *Terrier* surface-to-air guided missile has been placed in production. The new missile has considerably greater capabilities than its predecessor which has been in service with the United States Fleet since January 1956. The weapon will be included in the armament of a number of modern warships, including the nuclear-powered aircraft carrier *Enterprise*, two conventional



Improved *Terrier* missile

carriers, three guided missile cruisers, and 19 guided missile frigates. The first of the *Terrier*-equipped frigates, the *USS Dewey*, will be commissioned this year. Eventually, the *Advanced Terrier* will be employed on the nuclear-powered guided missile cruiser *Long Beach* and the nuclear-powered frigate *Bainbridge*.

The Marine Corps is equipped with mobile launchers and loaders for land-based use of *Terriers*.—Commercial source.

Military Schooling For Allies

Between 1 July 1957 and 30 June 1959 a total of 16,500 officers and enlisted men from allied countries graduated from courses of instruction in United States Army schools.—News item.

New Transport Helicopter

The Army has contracted for the development of a new transport helicopter to be designated the *YHC-1B (Chinook)*. Planned for flight testing late in 1960, the new helicopter is to have a cargo lift capacity of three tons and a troop lift capability of 33 passengers. Power is to be furnished by two *T55* shaft turbine engines, providing a cruising speed of 125 knots or greater. The initial contract calls



YHC-1B (Chinook)

for the design and development of five aircraft. The *Chinook* will be equipped with a rear ramp for speed in loading and unloading cargo and troops. The ramp can be left open in flight to permit the carrying of cargo items longer than the 30-foot payload compartment.—News item.

STRAC Radio System

A versatile Army radio communications system has been developed especially for STRAC (Strategic Army Corps) units and is geared to the quick reaction demands of small wars and brush fire com-

bat operations. Designated the *AN/TSC-16*, the new equipment gives Army combat commanders a communication capability previously possible only in large, fixed radio installations. The equipment can be transported by air or moved overland. It



US Army Photo

STRAC AN/TSC-16 comcenter in operation

consists essentially of a single-sideband 10-kilowatt transmitter and receiving equipment and is contained in two vans. The vans, together with tractors and power trailers, weigh about 70,000 pounds. The system, with 46 operating personnel, can assemble, load into three *C-124* aircraft, and be airborne within 12 hours. Upon arrival the set can be ready for interim operation in about four hours, and be ready for full-scale operation in two days. It has a range of 1,000 to 2,000 miles, and provides two voice channels and as many as 16 teletypewriter channels. The first of these sets has been issued to a STRAC signal unit.—Official release.

Navy's 'Skimmer' Makes First Flight

The latest in a series of research vehicles being developed by the Navy employing the air cushion principle for low-level flight has completed manned flight tests successfully. Known as the *Skimmer*, the

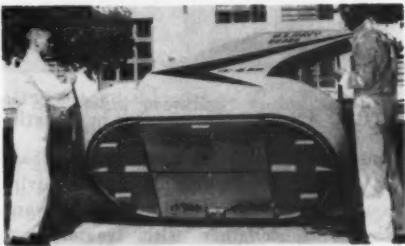


US Navy Photo

Skimmer begins to leave the ground

vehicle is lifted from the surface of the earth by a cushion of high-pressure air trapped by a jet of compressed air ejected through vents on the outer edges of the base of the machine.

Planned experiments with this newest



US Navy Photo

Peripheral vents eject compressed air to form ground cushion

model will help to determine the behavior of much larger ground cushion vehicles at heights up to 30 feet and speeds up to 100 miles per hour. When perfected the *Skimmer* will carry loads heavier than aircraft at speeds greater than conventional surface vehicles and will provide mobility over land, marsh, or water.—Official release.

'Red-Eye,' A Shoulder-Fired SAM

A new man-transportable, shoulder-fired surface-to-air missile is under development for the Army and Marine Corps. Feasibility tests completed during the past year have led to the award of a six million-dollar contract for further development of the weapon.

The missile launcher, outwardly resembling the "bazooka" of World War II and Korea, is approximately four feet long,



Foxhole air defense weapon

three inches in diameter, and weighs about 20 pounds. It is effective at altitudes and ranges commensurate with defense of field positions and amphibious operations against strafing and bombing aircraft. The launcher tube serves as a shipping container for the missile when capped at both ends.

Red-Eye is a composite structure containing propellant, guidance system, and warhead. It is reported to employ an infrared "heat-seeker" to guide it to its target.

Both the missile and its launcher can be carried by one man through underbrush and rugged terrain where more cumbersome antiaircraft weapons could not be transported.—News item.

Army To Use Navy Drone Target

The Army has awarded a production contract for the *KDB-1* drone missile target. Originally developed for Navy use, the *KDB-1* meets an Army requirement



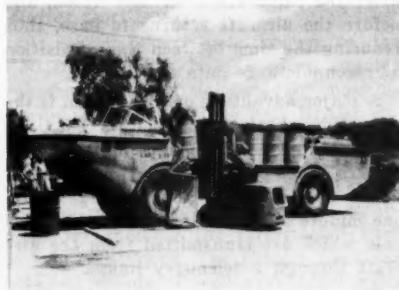
KDB-1 drone in flight

for a low cost, recoverable target vehicle capable of simulating enemy aircraft at low levels and up to 40,000 feet. The vehicle has a gross weight of less than 600 pounds and a wingspan of 12 feet, six inches.—Commercial release.

First Tests Of 'LARC-5'

The first model of a new series of light-weight amphibians entered the test phase of development recently. Known as the *LARC-5* (lighter, amphibious, resupply, cargo), the new craft is of all-aluminum construction and has a lift capacity of

five tons. It is designed to replace the 2½-ton *DUKW*'s of World War II, most of which are now unserviceable. Improved features are: a better marine capability, including greater speed and the ability to negotiate heavy surf, and greater ease of maintenance. Large, low-pressure tires afford exceptional mobility in sand and off



US Army Photo
LARC-5 with side gates removed

roads. It has removable side gates to facilitate loading and discharge of cargo.

The vehicle is nine feet wide, 35 feet long, and is powered with a single 270-



US Army Photo
LARC-5 on a beach approach

horsepower engine located aft. Its water speed is approximately 10 miles per hour and it will travel 30 to 35 miles per hour on the highway.—Official release.

Air-To-Ground Phototransmission

The Army has under development an air-to-ground phototransmission system for in-flight relaying of aerial photographs to ground viewing stations. The new system will allow a field commander to view photographs taken from a drone or a manned aircraft almost immediately after the camera shutter has closed, and before the aircraft returns to base, thus reducing the time between the acquisition of reconnaissance data and its use.

A major advantage of this system is the resolution obtainable which is equal to that obtained by a high-quality aerial camera. Fast processing makes the reproduced film available for viewing within one minute after receipt of the video signals which are transmitted from the aircraft through a telemetry link.

The airborne equipment occupies about 1,500 cubic inches and weighs about 45 pounds. It is packaged much like a conventional aerial camera.

On the ground, the video telemeter signals are picked up by a narrow beam, high gain antenna and fed to a high resolution recorder and a direct-view monitor. The direct-view monitor has a relatively low resolution capability, and provides only a rough picture. High resolution pictures are produced by the ground recorder through the use of photographic film. A fast processor makes this film immediately available for viewing. The device includes a stereo capability.

The ground equipment is packaged in an air-transportable shelter, and it is envisioned that disassembly and remounting can be accomplished easily by one man.

Field testing of prototypes of this equipment is scheduled for the latter part of this year.—News item.

NASA Plans Communications Satellite

The National Aeronautics and Space Administration (NASA) plans to launch a passive communications satellite some-

time during the latter part of this year as a portion of a transcontinental radio link. The passive system, as opposed to the repeater satellite currently being emphasized by Defense Department agencies, depends on the satellite only as a reflecting surface off which to bounce radio signals from one ground station to a distant receiver. NASA is reported to favor the passive system because it is considered more practical immediately.

The 65-pound satellite will consist of a sphere of aluminized plastic which will be inflated to a diameter of 100 feet once in orbit.

It is planned eventually to place a number of these satellites into orbit at an altitude of 3,000 miles. The initial attempt, however, will be to place one into orbit 1,000 miles above the earth's surface with which to conduct communications tests between a station operated by a private company in New Jersey and a station at Goldstone, California.

The single satellite system will provide communications between the two terminals for only a matter of minutes during each orbital passage of the sphere. Continuous communications is considered feasible through the use of a series of approximately 12 of such spheres.—News item.

Resuscitation Devices

Medical authorities under the auspices of the Army Chemical Center have designed experimental models of devices to permit the effective use of mouth-to-mouth resuscitation of suffocated victims by inexperienced personnel. Used in lieu of the old manual artificial respiration system, the mouth-to-mouth system is highly efficient and simple to use.

Two devices have been developed. One is a simple tube and valve arrangement to be used under normal conditions. The other is for mask-to-mask use in a contaminated environment.—News item.

GREAT BRITAIN

'Hovercraft' Shown To Public

A four-ton prototype of the British-designed and built *Hovercraft* was unveiled recently in the British Isles. Designated the *SRN1*, the new vehicle is intended primarily as an overwater transport but is equally adaptable to overland use. It utilizes a large wooden-blade fan to produce a cushion of air between its



Hovercraft rests on a cushion of air

bottom surface and the water or land over which it is passing.

The prototype can hover without forward motion and has minimum surface drag since it operates approximately one foot above the surface. It has a forward speed of approximately 25 knots.

Later models are expected to fly at heights of three to five feet and at a speed of up to 120 knots. The air cushion principle of flotation provides an exceptionally smooth ride regardless of surface conditions.

A significant feature of the craft is its economical requirements for power. It is estimated that a 400-ton *Hovercraft* would require only about one-fourth of the engine power of an aircraft to carry up to twice the aircraft's payload.

The principle of flight utilized by this craft varies from that used by the United States-developed *VZ-8P* flying jeep (MR,

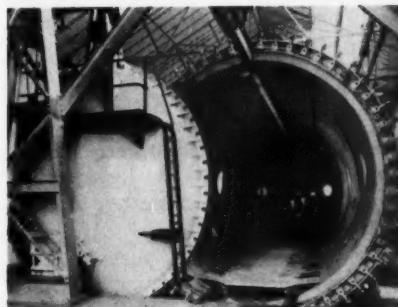
Apr 1959, p 64) in that the US vehicle depends on lift from horizontal rotors to maintain it airborne. The *Hovercraft*, on the other hand, uses the airstream produced by its fan to eject a cushion of air underneath the craft, thus forcing it up from the surface of the earth.—News item.

'Flutter Dart'

A rocket test vehicle known as the *Flutter Dart* has been used to provide valuable aerodynamic data for possible use in the design of the first British supersonic airliner. The supersonic, rocket-propelled airliner test vehicle carries devices for measuring movements of wing and control surfaces and electrical equipment for radioing the information back to ground stations. The *Flutter Dart* has attained speeds of well over 1,000 miles an hour in test flights.—News item.

Test Chamber

A test chamber capable of simulating supersonic flight speeds of up to Mach 3 and physical conditions equivalent to 19 miles elevation has been completed at



British test chamber

Yeovil, Somerset, England. The test chamber is to be used for research on supersonic aircraft, industrial problems of heat transfer, and the solving of problems in the nuclear power industry.—News item.

New Howitzer Undergoing Tests

A versatile 105-mm pack howitzer of Italian design is undergoing field trials by the British Army. The weapon can be used as a field gun, an antitank weapon, and as a heavy mortar. The test version is a two-wheel towed model that can be quickly lowered on adjustable legs as an antitank weapon. It also can be elevated to an angle of 70 degrees to fire in the role of the 4.2-inch mortar. The weapon can be broken down into component loads by its crew of six, and is readily air transportable.—News item.

AUSTRALIA

Early Warning Radar Screen

Scheduled for completion during mid-1960 a new radar screen is under construction which will provide warning service to all of northern Australia. Cost of the system is estimated at approximately 4.5 million dollars.—News item.

NATO

New Signal System Links Commands

A new signal communications network will link the major military headquarters of the North Atlantic Treaty Organization when completed in 1961. The first portion of this system became operational this summer as a link between Supreme Headquarters Allied Powers Europe, in Paris, Headquarters Allied Forces Southern Europe, in Naples, and Headquarters Allied Land Forces Southeastern Europe, in Izmir, Turkey.

The system will employ the forward scatter principles of reflecting very high frequency radio waves off of tropospheric and ionospheric layers of the atmosphere at altitudes of 25 to 80 miles above the earth's surface. The completed system will provide a reliable communications link from northern Norway to eastern Turkey, a distance of some 1,500 miles.—News item.

Treaty Nations Produce Missiles

Commercial firms located throughout the western European countries of NATO are continuing to increase their missile design and production capability. Of significance in the missile development field are the *RSC-57* and the *RSD-58* surface-to-air missiles offered to the military market of the non-Iron Curtain countries by an Italian subsidiary of a Swiss manufacturer. This firm also produces a wire-guided antitank missile, the *Mosquito*, which is in competition with the French *SS-10* and *SS-11*. Contributions to the Italian firm by industrial firms of other NATO countries include tracking radar from Belgium.

The *Mosquito*, developed in close coordination with German industries, is a small weapon, weighing only about 23 pounds with an eight-pound guidance system. The weapon is reported to travel at 16,500 feet per minute and to have an operating radius of about 6,000 feet.

Reports also indicate that the United States-designed *Hawk* missile and possibly *Sidewinders* will be produced by western European nations under assistance furnished by the United States Military Aid Program.—News item.

Swimming Bridge

On trial with NATO forces in Western Germany is an assault pontoon bridge called the *Gillois* after its designer, a French lieutenant colonel. Each bridge section is mounted on a vehicle which can travel at a speed of 35 miles per hour on land and seven miles an hour in the water. The bridge decking of each unit can be revolved on its carrier through an angle of 90 degrees and linked to the decking of other units to form a completed bridge. In recent demonstrations a 150-foot river was spanned in 11 minutes to permit a British *Centurion* tank to cross at a speed of 20 miles per hour.—News item.

NATO Pipeline System

A complex system of military pipelines is under construction throughout western Europe to link advanced depots and airfields to various Atlantic and Mediterranean ports. Portions of the system are now in operation and the balance of the 8,000-kilometer network is scheduled for completion in 1961. Covering the geographical territory of 10 nations, the system is divided into regions. Those regions which coincide with national boundaries are directed by national operating agencies. An international operating agency runs the portion of the system which is in central Europe. Coordination for the over-all operation is provided by the NATO pipeline committee.—News item.

CANADA

Passing Of The 'Bren' Gun

The famed *Bren* gun, which has seen service with Canadian forces around the world since its adoption in 1937, will soon be replaced as the infantry section weapon by the new "heavy barrel FN" automatic rifle. The new weapon weighs 12½ pounds—seven and one-half pounds lighter than the machinegun it replaces—and can fire 100 more rounds per minute. The *FN* will use the standard 7.62 NATO round.—News item.

ISRAEL

Pipeline Planned

The Israeli Government and a group of private investors have formally signed an agreement for the construction of a 16-inch pipeline from the Red Sea to Haifa, bypassing the Suez Canal. The line will be built from Elath, at the head of the Gulf of Aqaba on the Red Sea, to Haifa on the Mediterranean. It is to have an annual capacity of 5,800,000 tons of crude oil. Scheduled for completion by mid-1960, the project calls for an investment of more than 19 million dollars.—News item.

EGYPT

Suez Canal Improvements

Authorities in Cairo report that work has started to deepen and widen the Suez Canal. Requiring 14 months for completion, the program will cost approximately 4.5 million dollars, and will permit the passage of vessels with a 37-foot draft. The canal can now pass vessels drawing 35 feet. Future work is contemplated which will extend the permissible draft to 45 feet.—News item.

JAPAN

Tea, An Antidote For Strontium 90

Japanese scientists have announced successful results from tests involving the use of tea as an antidote to the effects of strontium 90, an isotopic product of radioactive fallout.

Research on tea and strontium 90 began when victims of Hiroshima and Nagasaki bombings reported that tea made them feel better. Subsequent tests using white mice indicated that dosages of two percent solution of tannin, a substance contained in tea, would absorb and carry away as much as 90 percent of the dangerous isotope before it could reach the bone structure and cause serious damage.—News item.

USSR

Manpower Problems

Russia, normally considered as having an inexhaustible reserve of manpower resources, is reported to be suffering from a shortage of adult males. In the 32-year age group and over there are nearly two women for each man. Long a closely guarded secret, Russia's losses during World War II were estimated at approximately seven million. Recent estimates, however, have more than doubled this figure. Demographers estimate that the low wartime birth rate in the USSR has decreased her present population by as many as 40 million people.—News item.

'Tu-114' To Enter Commercial Service



Giant *Tu-114* airliner

Representatives of Aeroflot, the Soviet state airline, have indicated that the giant *Tu-114* turboprop airliner will enter commercial service within the Soviet Union before the end of the year. First viewed in the United States this summer the *Tu-114* is the world's largest commercial airliner. It has a wingspan of 177 feet and is 154 feet, 10 inches in length. These figures compare with a wingspan of 142 feet and a length of 153 feet for the Boeing 707.

The commercial versions of the aircraft are reported to accommodate up to 220 passengers, using eight abreast seating. A more conventional loading, however, would be 170 passengers in six abreast seating. This latter arrangement includes four roomettes with two divans and one folding bunk each.—News item.

'Hook' Sets Load-To-Height Record

The Russian *Mi-6* helicopter, commonly referred to as the *Hook*, is reported to have broken all previous records for "load-to-height" lift by hoisting a five-ton load to an altitude of 18,207 feet and a 10-ton load to 15,090 feet. This aircraft is one of the largest helicopters in existence, is credited with a normal seating capacity of 70 to 80 persons, and a maximum load of up to 120 persons.—News item.

UNITED ARAB REPUBLIC Arms Budget Increased

The United Arab Republic has increased its proposed budget for military expenditures for the next 12 months by 12.5 million dollars over last year's allocation. The new republic's total national defense expenditures for Fiscal Year 1960 will be 331 million dollars.—News item.

TURKEY Korean Brigade Maintained

The recent arrival of replacements for the Turkish brigade serving with the United Nations forces in Korea brings the total Turkish Army personnel who have served in the Far East theater to a figure in excess of 45,000. The Turkish Government follows a regular annual rotation in fulfillment of its national obligations in Korea.—Official release.

New Jeeps Slated For Land Forces

The Turkish Land Forces are slated to receive 1,600 new four-wheel drive, quarter-ton trucks as replacements for vehicles that have served since World War II.

The new vehicles are to be assembled in Turkey from components manufactured in the United States under the Military Assistance Program.—Commercial source.

MILITARY DIGESTS

Tummy Trouble

Digested by the MILITARY REVIEW from a copyrighted article by Major Reginald Hargreaves in "The Army Quarterly and Defence Journal" (Great Britain) April 1959.

A general must know how to get his men their rations and every other kind of store needed for war.—Socrates

IT WAS Sir John Hawkwood, leader of the famous medieval band of mercenaries known as the White Company, who once pronounced that, "You don't win victories on an empty belly." He was at all times at considerable pains to ensure that his men did not go into action hungry. On one occasion, when the immediate reduction of a small, but stoutly defended, stronghold was essential so that another contract of service could be fulfilled exactly on time, he sought out the nearest ecclesiastical dignitary to demand dispensation from the traditional Friday fast. With a gleaming, sharp-pointed misericord in close proximity to his ribs, the cleric hastened to grant the necessary "indulgence." So instead of a miserable dish of salt herrings under their belts, the men of the *Compagnia Bianca* went into action full-fed and, therefore, on the top of their form. The town was captured, and Hawkwood was free to take to the road to his next engagement with exemplary punctuality.

Such was the outcome of a born leader's clear-sighted recognition of the cardinal fact that hunger is only second to lack of sleep in draining the fighting quality out of a man, and thereby inviting condign defeat.

Napoleon Bonaparte, unblushingly "borrowing" from Miguel de Cervantes, laid it down that, "An army marches on its stomach."¹ But he was not the first to recognize that, whatever else may betide, the soldier is hungry, with extraordinary punctuality, three times a day; and that it behooves a wise commander to ensure that his pangs are as punctually appeased.

The Spartan Approach

Few men can have been kept under bonds of stricter discipline than the legionaries of Imperial Rome. But they were well-fed on plain but wholesome food, which was consumed in *maniples*, or messes, of 10 men under the control of a noncommissioned officer known as a *decarius*. Whether in garrison or on active service, the troops' supplies were furnished out of the resources of the local countryside; everything being paid for promptly by the quaestor and his subordinates. Extra provisions and small luxuries could be purchased from the sutlers attached to the legions.

On occasion hunger was made the servant of discipline. A common form of punishment was to withhold a man's wine ration or substitute a barley loaf (*bordeum*)

¹ Cervantes phrased it, "The stomach carries the feet."

for the wheaten bread with which he normally was supplied. At all times marauding was penalized severely; if a man so much as filched an apple, he risked a flogging.

By predilection the Roman soldier was not much of a meat eater, being quite content with his wheaten porridge, cheese, fruit, and vegetables. Although liberally and regularly fed on these comestibles, by modern standards his way of life was undoubtedly Spartan—and intentionally so. For as expressed by the military commentator Flavius Vegetius Renartus, the contemporary belief was that, "The less a man is acquainted with the sweets and luxuries of life, the less reason has he to be afraid of wounds and death."

A similarly Spartan outlook characterized the armies of the famous Persian commander, Shah Abbas. Provisions were all paid for with the greatest promptitude; pillage being strictly forbidden. One under officer of many years' service, who had commandeered some fruit without offering any money in exchange, was arrested promptly, had his nose pierced with an arrow and in this condition was paraded before the entire army. Having provided his troops with elaborate field kitchens and his commissaries with ample funds, the shah was in no mind to tolerate the slackening of discipline that personal marauding inevitably involved.

The standard of conduct was nowhere near so exemplary with the armies of medieval Europe. With them the practice of "living on the country" meant the scattering of innumerable small parties of men to forage on their own—hungry bands who rarely offered payment for the provisions they peremptorily requisitioned. Not only did this haphazard procedure make it difficult to concentrate troops quickly in the event of a sudden alarm but it proved extremely bad for discipline, since it led to incessant quarrels between the "haves" and the "have-nots." In addi-

tion, it had the effect of bitterly alienating the civil population of the country-side laid under contribution.

Establishment of Supply Lines

On more than one occasion unwarranted reliance on an army's ability to "live at free quarter" had serious military consequences. The Anglo-Galic Campaign of 1356, for example, led to further fighting which, owing to difficulties over supplies, almost ended in the English abandoning the field. After the Battle of Poitiers and the capture of King John of France by England's Edward III, the Dauphin Charles, acting as regent, refused to fulfill the terms of the treaty which would have released his father from captivity and brought the war to a close. Edward, thereupon, set out to assert his rights by the sword, but it seemed impossible to bring the wily Dauphin to battle. Having first reaped the harvest and driven in the sheep and cattle, he laid waste the entire countryside, while shutting up his troops in impregnable walled cities to abide the issue.

Edward, expecting to "live on the country," found nothing upon which to support existence in a howling wilderness that yawned emptily under perennially rainy skies. The outcome would have been disastrous but for the English King's energy in organizing a service of supply and transport, based on magazines of provisions established in England. Untrammeled communication with these magazines was ensured by his command of the English Channel. At long last the half-starved English bowmen and men-at-arms could rely on a reasonably steady flow of victuals—save when the lumbering wains broke down on vile roads rendered all the more difficult to negotiate by the incessant downpour. For an army of under 50,000, a shuttle service of no less than 8,000 wagons operated day and night to ensure the minimal level of subsistence. It was one of the earliest attempts to found a

properly organized system of supply and transport of which there is record; and considering the degree of improvisation involved, its success was astounding.

The establishment of magazines in the *terrain de campagne*, which gradually found widespread adoption, introduced a far better method of subsisting troops than was ever possible under the random process of "living on the country." It even became possible to lay down a basic scale of rations. In the contemporary Ordinances

fixed magazines, however, had the effect of seriously circumscribing the troops' mobility, since with bad roads along which to channel supplies the tendency was to retain the bulk of the army as near as possible to its prime sources of subsistence.

It was the Duke of Marlborough who restored freedom of movement to a stagnant condition of warfare without any sacrifice in the standard of alimentation necessary for the troops' well-being. While retaining fixed magazines to accommodate

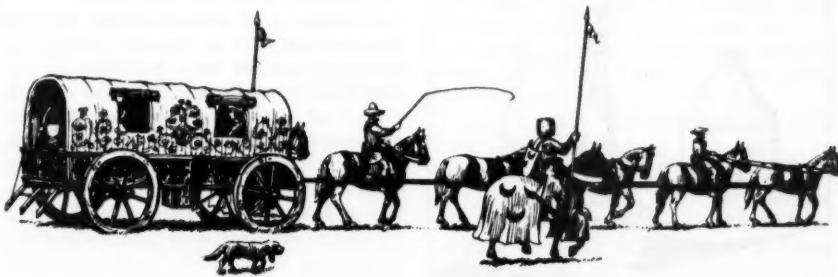


Illustration from *Wheels* by Edwin Tunis,
published by The World Publishing Company

English long wagon, early 14th century

of War the Proviand-Master is instructed to ensure the daily issue of "fresh flesh, wyne, bread, and beer"; while he was further recommended, whenever possible, to vary the ration by ringing the changes on "stockfish, herrings, and all manner of salted fishes, salted and hung fleshes, especially beef and bacon, cheese, butter, almonds, chestnuts, and hazel nuts, honey, vynegar, and oyl." These refinements were to be distributed, as occasion offered, "as a relish." Salt was always to be "convenient"—that is, accessible—while pepper and mustard were essential to a diet in which the meat was invariably tainted and the cheese and butter certain to be rancid.

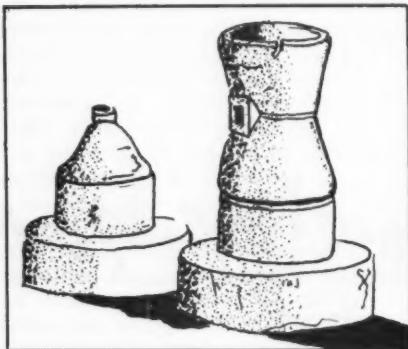
The accumulation of commodities in

his bulk stores, he established a system of well-organized supply convoys to accompany his forces on the line of march. Bread wagons² were supplemented by entire herds of cattle—beef on the hoof—and a swarm of sutlers, who vended additional provisions at strictly controlled prices. If the rates of pay were low, so was the price of commodities—with fat bacon at a penny a pound and beef and mutton at one and a half pence, and with prime smoking tobacco at threepence a pound. (There was a great outcry in 1708 when the price of tobacco suddenly was raised by a halfpenny a pound.)

² These wagons were so well-designed and stoutly constructed that wains of similar pattern are still in daily use in Bavaria under the name of *Marlbrouks*.

Marlborough organized his own mills for grinding flour, and employed bakers to turn it into standard-size loaves. This was a great improvement on the method, frequently employed by the Romans, of issuing handmills—so many to a *maniple*—so that the men could grind their own corn before baking it in the regimental ovens.

But the handmills offer the only way out when no professional millers are handy



Roman handmill. At left is the lower mill-stone. At the right is complete mill.

to process the grain. At the investment of the Turkish stronghold of Cephalonia by the Spanish-Venetian forces under Gonzalo de Cordoba, in 1500, for example, only unboiled flour was available for the use of the besiegers, for no mill was to be found within many miles. Not only did Gonzalo furnish handmills to his troops, but, lacking other means of separating the grain from the chaff, he impounded the veils worn by the innumerable camp harlots, and sifted the wheat through them. He then set the women to work baking bread in improvised ovens built along the shore; while the camp boys boiled up bruised grain with lard. This was mixed up with a malodorous mess of onions, cucumbers, garlic, and

chillies, chopped very fine and moistened with olive oil, vinegar, and the lees of wine—a revolting mishmash calculated to paralyze any normal throat, but one which Cordoba's famished troops swallowed down with every appearance of relish.

Wallenstein, the outstanding commander of the Thirty Years' War, was careful to issue his troops with handmills and sacked wheat against the possibility of a breakdown in the supply of bread and "biscuit"—that is, twice-baked bread that remained perfectly edible for weeks on end.³

The American Revolution

Although started on the right road by Marlborough, for a lengthy period the service of supply was bedeviled by the fact that it remained under the over-all control of civil departments of the government. Writing of their characteristic methods of procedure, the noted military commentator, Jacque Antoine Hippolyte Comte de Guibert, in *Defense du Système du Guerre Moderne*, sourly recorded that:

Since the details of subsistence have been taken from the officers, the officers no longer study them. They are in the hands of the bureaux, and the bureaux are the sworn enemies of all that tends to put the details of military administration into military hands.

In effect, hidebound and obstructionist civilian functionaries muddled things at home, while the handling of supplies in the field was under the immediate direction of nonmilitary commissaries. To make bad matters worse, entirely different organizations were responsible for the wagon and for the load. As often as not this diffusion of responsibility left the hungry soldier woefully in the lurch.

During "the starving days" at Valley Forge for instance, with General Mifflin more concerned to intrigue with Gates and

³ It was upon this variety of "biscuit" that crews and passengers subsisted during the long passage from western Europe to the Holy Land during the Crusades.

Conway for Washington's overthrow than to attend to his duty of prodding Congress into furnishing the necessary supplies, the unfortunate troops eked out a miserable existence on a diet that rarely went beyond firecake—an admixture of flour and water baked on flat stones among the embers. It was extremely poor fare at the best of times, let alone in the depths of a particularly vicious winter. Should a barrel of salted herrings come the men's way, all too often it was so badly spoiled that the fish could not be drawn out singly but "had to be shoveled up en masse." Even when "Mad Anthony" Wayne did contrive to get his hands on a few beef cattle, the flesh was so scraggy and lean that the saying went around the camp that, "You could see the butcher's breeches through the meat."

When General von Steuben gave a dinner to his aides and a number of junior officers, rations were clubbed and the company "feasted sumptuously on tough beef steak and potatoes, with hickory nuts for dessert."⁴ There was no wine, but, out of a meager supply of spirits, toasts were drunk in "salamanders"—the fiery liquor being set ablaze and quaffed down "flames and all."⁵

One unlooked for source of supply materialized when the Schuylkill filled with shad swimming upstream to spawn. Harry Emerson Wildes, in *Valley Forge*, stated:

Soldiers thronged the river bank. Then, at the advice of the Pennsylvanians accustomed to the yearly fishing, the cavalry was ordered into the river bed. Carrying huge bushes, broken tree boughs, and long sticks the horsemen rode upstream, noisily shouting and beating the water, driving the shad before them into the nets spread across the Schuylkill at Pawling's ford, where the Perkiomen flows into the river. . . . Thousands of tasty, rich shad were netted in each haul. The netting was con-

tinued day after day, with more than a hundred horsemen continually beating the water, until the army was thoroughly stuffed with fish; and in addition hundreds of barrels of shad were salted down for future use.

But privation was not confined exclusively to the American forces. During operations in Cherry Valley in 1778 the King's Rangers, long isolated from their base and hard pushed for supplies, subsisted for weeks on emergency rations consisting of parched corn, maple sugar, and a little pemmican. In the Boer War of 1899-1902 both Boers and British made considerable use of *biltong*—the meat of beef cattle, eland and hartebeeste cut into strips, salted, and dried, pemmican fashion.

Napoleon and Wellington

The legend which has grown up as to Napoleon's supreme ability as a commander, while ignoring the fact that he was sent away with a flea in his ear from beneath the walls of Acre, that he blundered in Spain, suffered staggering reverse in Russia in 1812, was crushed in Germany in 1813, reduced to ruin in France in 1814, and met overwhelming defeat at Waterloo in 1815, also overlooks his appalling casualness about supplies.

"Soldiers!" the young general of the Revolution had thundered on the eve of his descent into Italy in July 1796. "Across these mountains lie rich lands, food, drink, and clothes. All is yours if you arrive where I direct, and follow me where I shall lead." And upon the bandit like conception that "war should be made to support war" he based his calculations ever after. In the terrible retreat from Moscow his troops died like flies, as much from malnutrition and hunger typhus as from the searing winter conditions under which their march was undertaken. Yet, normally, a retreat at least has this saving grace—that those committed to it are falling back upon an increasing bulk of sup-

⁴ *Frederick William von Steuben and the American Revolution*, Joseph B. Doyle.

⁵ *Ibid*.

plies. This is fortunate, since successful withdrawals are the outcome of tenacious, stoutly fought rearguard actions. Although the soldier is rarely hungry—but extremely thirsty—during a fight, after he has pulled out reaction sets in; and the necessity to restore his vitality, and with it his morale, becomes paramount. It is then that wholesome, nourishing food—and some home mail—can play an absolutely vital part. "Nourishing" and "wholesome" are the operative words. During the Scind Campaign of 1848 General Sir Charles Napier was seen to throw away an army biscuit with the muttered comment, "Though not a bad soldier, hang me if I can stomach maggots."

In contrast to the little Corsican, Wellington was careful about supplies for his troops, as careful as it was possible for any man to be whose efforts were hampered at every turn by the corruption and ineptitude of the government departments concerned with furnishing his wants, and the variable quality of the commissioners entrusted with the concentration of food-stuffs and their subsequent distribution. His task was made no easier by the fact that responsibility for wagon and for load was still in different hands. Furthermore, the extravagant cost of hiring Portuguese and Spanish teamsters and privately owned bullocks and mules created another galling problem at a time when the intermittent doles of hard cash invariably failed to keep pace with current expenditure. The last-named, as Brigadier Ballard Long recorded:

. . . was incredible. With mules hired at a dollar a day, with forage, and with many Spaniards disposing of upwards of 50 of them, these Dons absolutely realize per diem a better salary than the commander in chief himself receives.

But service in India had taught "the Sepoy General"—as his detractors sneeringly termed him—a lesson he never forgot. He often used to declare:

You should take care to initiate no movement until you can be sure of plenty of provisions. In India, if I had rice and bullocks, I had men; and if I had men I knew I could beat the enemy.

So it fell out that the moment he landed on the Mondego, on the eve of his victorious Peninsular Campaign, his first concern was to draw up a table detailing the exact load to be put on every mule's and horse's back.

Throughout the entire campaign, however, at every turn the duke's labors on behalf of his troops' welfare were hopelessly betrayed by the muddle and complacent inefficiency of the civil departments responsible for bulk purchase and the stocking of his supply depots. Time and again his hard-worked divisions went hungry. On the strategic withdrawal from Madrid in 1812 the men actually were reduced to roasting acorns, for want of any better fare; the commissaries having failed to produce even the basic ration of biscuit.

Bottlenecks and Profiteering

Indeed, Wellington was little better served by his commissaries than the commanders who had taken the field in the Seven Years' War and the War of the Austrian Succession. Yet one of the more complacent of the breed actually complained to the commander in chief that General Sherbrook, commanding the Guards Division, had threatened, if supplies were not forthcoming with greater punctuality, to hang him from the nearest tree.

Wellington turned a face of stone on the indignant functionary, and rapped out, "General Sherbrook said that, did he?"

"Indeed he did, my lord," the man replied, all aglow at the thought of the reprimand he confidently anticipated would be administered to the peccant guardsman.

"H'm," grunted Wellington; "then all I can do is to advise you to produce your

supplies with greater punctuality; for if General Sherbrook said he'd hang you, then by God he'll do it."

Commissaries appear to have possessed the knack of arousing widespread loathing and distrust at every period of history. As early as 1503 the bailiff of Caen, acting as chief commissary to the French forces opposing the Spaniards on the Garigliano River, returned to his homeland at the end of the campaign to be condemned to the gallows for shameless peculation. Both sides were plagued by the rapacity and unreliability of their commissaries in the War of Independence; while the veteran Suvaroff once threatened to string up his quartermaster general with his own hands if he failed to bring his commissariat department to a better sense of its duties.

However, if they filled their pockets at some risk, they undoubtedly lined them to considerable advantage. Lawrence Dundas, who was Commissary General to the British Army from 1745 to 1759, in that relatively short period, amassed "pickings" which enabled him on his death to leave "an estate of 16,000 pounds and a fortune of 900,000 pounds in personalities and landed property." Brookes Watson, a commissary during the campaigns of 1793-94, feathered his nest so well as subsequently to support the dignity of the Lord Mayoralty of London; while his principal contractor, in the words of a contemporary, "was a Mr. Eckhard, a Hanoverian Jew, a clever man who did his best for the army, and himself, for he made a large fortune and became Baron Eckhardstein."

The Reform

Civilian control of funds, as for the organization [sic] of supply and transport, did much to account for the shambles, both at the front and at the base, in the early days of the Crimea. Not only were

the men inadequately clad to face a Black Sea winter, but the arrangements for their subsistence left each private soldier with his individual meat ration on his hands, without fuel with which to cook it; while his coffee was issued in the form of unroasted beans.

It was not until the revealing dispatches of William Howard Russell had aroused the voice of the public to demand redress that the famous chef, Alexis Soyer, was sent out to the Crimea to try to put things right so far as subsistence was concerned. So successful were his efforts that they were commemorated in the rhyme,

*A cook can defy, you see,
A commissariat's knavery:
The soldier who saves a nation free
Should have a ration savoury*

Starting with an extremely small nucleus of regular forces and a comparable supply organization, so far as subsistence was concerned, both sides in the War Between the States were for long condemned to wasteful, haphazard, and thoroughly unsatisfactory improvisation. In many ways the Federal officers were the most unfortunately placed, since they were not on the ration strength and had to provide their own alimentation. But as Captain John William de Forest of the 12th Connecticut Volunteers ruefully recorded, their pay being always in arrears—sometimes as much as eight months—they often were without money to buy the ingredients for a meal. Indeed, but for a little timely help from the Sanitary Commission, many of them would have been confronted with the unpleasant alternative of starving or setting a bad example to their men by foraging.

An enormous stride forward was made in 1880, when, with the formation of the British Commissariat and Transport Staff (reorganized in 1888 and renamed Army Service Corps), supply arrangements came directly under military control. At last a single disciplined organization as-

⁶ The Taylor Papers, Lieutenant General Sir Herbert Taylor. The italics are Taylor's.

sumed responsibility for bulk purchase, for the wagon and the load and for the detailed distribution of supplies to their consumers.

Through trial and error under active service conditions, the problem of supply and transport in the field was worked out to such good purpose that in both World Wars I and II the armies of the two English-speaking peoples tended rather to be overfed than the other way around—from the point of view, that is, of facilitating operations. This was possible since, even under conditions of open warfare in North Africa and, subsequently, in Europe, supply depots and the lines of communication, generally, were free from sustained and heavy molestation by the enemy.

The Future

As far as anything in the way of a major conflict is concerned, there seems every probability that combat will extend over a battle zone anywhere up to 200 miles in depth. With atomic tactical weapons in use on both sides and swift, fluid movement and wide dispersion the order of the day, large accumulations of supplies will be out of the question. They would provide all too tempting a target for atomic bombardment or hostile raiding parties. The breakup of troop formations into relatively small combat commands will, on many occasions, render the distribution of supplies so difficult as to cut them down to the bare essentials, such as can be transported by airplane or helicopter. Roads will be anathema; and in any case we have all been too obsessed with roads for far too long. Probably the most prodigious effort in supply along roads was the "Red Ball Route" which sought to keep pace with General Patton's whirlwind advance in the spring of 1945. Even so, the American sweep across France eventually outran its road transport; and since no system of supply by air had been organized at that time, Patton could never be

sure whether or not his tanks would run dry.

Obviously, in any campaign fought under the predictable conditions of the future, widely dispersed cross-country transportation plus airlifts will be the basis of all supply deliveries.

It is a fatal mistake to be more cumbersome of movement than one's opponent; and the most probable opponent the West will have to confront definitely falls into the category of those barbarians who, throughout history, have scored their staggering successes by the speediness of movement they attained through cutting down with the utmost rigor on their services of transport and supply.

The savage warriors who swarmed at the heels of Attila the Hun would pillage and rape and gorge when occasion offered. But in between their orgies they could live, metaphorically speaking, on the smell of an oily rag. The Mongol hordes of Genghis Khan "lived on the country" whenever possible; their organization including *Ungs* (an organized group of nine warriors under an *Ung-khan*) especially detailed to forage, and herd boys to take over the live cattle and provisions that had been rounded up. But if the need arose, the horde could move quite independently of the supplies brought in by marauding. According to Marco Polo's account, each Mongol warrior was obliged to take the field with 18 horses and mares, so that mare's milk and horse's blood would always be available for his sustenance. At all times a basic ration of yogurt was available, prepared with leaven from curdled milk. From the same source it also was possible to produce fermented *tshegan*, an extremely nutritious drink which in itself was sufficient to sustain life. In effect, so long as the Mongol warrior possessed a spare horse, he was certain of nourishment, which he was equally assured would go everywhere he went.

"The East," quoth the much-traveled

Lafcadio Hearn, "can always understarve the West"; an unchanging fact to which the campaign in Korea added the most recent witness. The disparity between the weight and complication of Western supply arrangements and those on which the barbarians contrived to exist and fight was starkly apparent throughout the entire course of events, and never more so, perhaps, than at the time of the Inchon landing. For this brilliant example of the potent use that can be made of exterior lines to strike at an enemy swiftly and unexpectedly demanded a supply "lift" of 1,065,000 operational rations and 1,250,000 gallons of gasoline; much of the latter being employed in transporting the former.

No wonder that the breakdown of the divisional "slice" among practically all the NATO forces reveals that for every man with a weapon in his hand there are upwards of 20 other men in uniform not only occupied in passing the ammunition and assorted supplies but also, one suspects, very largely in passing the buck. This would be scandalous enough were the most likely enemy committed to a similar ratio between the combatants and those who tail away behind them. But against an opponent whose supply arrangements have been pared down to the irreducible minimum it is plain lunacy.

Consumption Versus Manpower

With the example of Korea before us—where the enemy fighting man was often sustained by a single Communist comrade-in-arms, plus a few civilian carriers pressed into service, who humped the maximum of ammunition and the minimum of food forward on their backs—it is salutary to examine the appalling growth of supplies deemed necessary to maintain a Western army's frontline strength which little more than a century and a half has seen develop.

The tonnage per head required to support a frontline soldier in Napoleonic days

was half a ton; in World War I, three tons; by 1945, 16 tons. With the Western Powers it has now risen even above this staggering total. Nor can this be attributed exclusively to the increase in the number and weight of weapons employed nor the bulk of the munitions expended. Opinions may differ as to the relative quality of the arms supplied to the Communist forces and to those furnished to the Western armies. But there can be small doubt that little difference exists as to the scale. In effect, they represent much the same load. Yet it takes the labors of 50,000 men to put a full American field division in the line; and the proportion is much the same for a comparable British formation. Russia contrives to activate a somewhat smaller division with approximately 12,000 men. Yet Russia, be it noted, can produce four individuals of fighting age to America's three. "Manpower," President Eisenhower has pronounced, "is America's most precious commodity"; and the same may be said of the other NATO nations. It is clear, therefore, that it cannot be utilized to full advantage until the problem of manpower distribution has been seriously and ruthlessly overhauled.

Quite obviously, since munitions cannot be skimped, the solution to the problem very largely depends on cutting out the transport and personnel consuming frills in rations. Anything above the range of basic foodstuffs—plus the additional burden of incoming and outgoing mail—can scarcely be regarded as essential if your potential opponent can fight, and keep fighting, on an even more frugal standard of subsistence.

According to Otto Skorzeny, who long fought against him on the Eastern Front, the Russian soldier can sleep without hurt in wringing wet clothes, live on roots from the fields or chunks of raw flesh torn from a rotting horse, he can drink from marshes and shell holes, and subsist virtually without supply columns. For a hu-

man chain of women and old men always can be turned into beasts of burden to bring forward the necessary ammunition and minimum of food—in that order. It is clear, therefore, that the Russian soldier is not "acquainted with the sweets and luxuries of life" which Vegetius looked upon as so detrimental to a virile fighting spirit. And the same is true of his Chinese counterpart.

The plain fact of the matter is that the less civilized man has an indubitable ad-

vantage in war. His wants are simple; he is accustomed to hardship and frugality; his life is often so laborious that he rates it lightly. Of such kind have been the barbarians throughout history; of such kind are the barbarians who have been enslaved by the evil witchcraft of communism.

They are our potential opponents. If it comes to a testing, we shall have to beat them not only with our weapons but also with our stomachs.

Capabilities and Vulnerabilities in the Evaluation of Information

Digested by the MILITARY REVIEW from an article by Colonel Giuseppe Raimondi and Lieutenant Colonel Rodolfo Rufino in "Bollettino d'Informazioni della Scuola di Guerra" (Italy) September-October 1958. Translation by Mr. LaVergne Dale, Leavenworth, Kansas.

THE greatest degree of success that the intelligence unit can achieve in war is that the results of its intelligence activities be useful to commanders in making their decisions.

Search for information concerning the enemy would be useless if the intelligence unit were not able to translate this information into terms of *capabilities* and relative probabilities of adoption. These are elements of determinative value in the establishment of the commander's concept of action. The final phase of every informational process—fittingly termed the "utilization of information"—is concluded with the presentation to the commander of the appraisal of the enemy situation.

This concept of the result which must be achieved by offensive intelligence activity recently has been reinforced by a new concept which places the determination of the vulnerabilities of the enemy on the same level of importance as that of the determination of his *capabilities*.

In defining the missions of the chief of the intelligence unit, recent (Italian) reg-

ulations require, among other things, that he present his facts in the following order:

1. Mission of the intelligence unit.
2. Summary of the character of the zone of operations.
3. Enemy situation and capabilities.
4. Conclusions indicative of the probabilities, on the part of the enemy, of putting into action certain operational activities deriving from his capabilities and his vulnerabilities.

In the section relative to the enemy situation one of the paragraphs deals with the *enemy's peculiarities and weak points* (personnel, operations, materiel, and logistics). The conclusion includes two paragraphs dealing with probable capabilities of action and vulnerabilities.

Strategic Intelligence

The field of strategic intelligence includes the knowledge the civil and military authorities must have in peacetime to safeguard the security of the nation and to carry on military operations in time of war. The capabilities of a foreign

nation are represented in peacetime by the lines of action it is able to engage in on its own initiative, or as a retort to the initiative taken by others.

In war, in the field of strategic intelligence activity, the capabilities of an enemy army are represented by its ability to attain a given objective, expressed in terms of force and time. In case the enemy objective is well-defined, as, for example, the attainment of a vital strategic objective (Stalingrad) or the containing of an amphibious operation (the landing in Normandy), capabilities are represented by the strength of the ground, naval, and air forces the enemy is able to put in the field and maintain without diminishing his commitments in other strategic missions.

Vulnerabilities

Vulnerabilities are those weak points or negative qualities that a nation may present in its "strategic stature," that will affect its capabilities, or permit psychological, political, economic, and military weapons to deal it a blow at considerably less cost than a direct attack.

The determination of the vulnerabilities a nation may present is not a simple matter. This is not a reference to the essential indefensibility of its frontiers or to the relative ease with which it would be possible to destroy its cities, its ports, or its industrial establishments. Rather, it is necessary to focus on and evaluate those weak points whose exploitation can lead to very extensive results in comparison with the means employed, rendering the operations useful and, at the same time, economical.

Typical examples of this in the military field are to be seen in the great results obtained by the Allies in Germany by all-out concentration of strategic bomber effort on the targets represented by the plants for the production of synthetic fuel and aircraft. Similar results were obtained in Japan by the attacks conducted against

the transportation which carried coal between Hokkaido and Honshu.

A current example in the political field could be the work done by the West to render more insecure and strained the relations between the satellite countries and the dominant nation, with special attention to those countries most susceptible of being influenced.

The investigation of the specific points of vulnerability of a nation cannot, however, be directed toward the entirety of its internal structure, but must be confined to those fields which can be explored by deduction and on the basis of knowledge of the limits of one's own means of exploitation.

The vulnerabilities of an enemy army may be defined as those conditions of weakness which can render it a particularly easy prey to attack, deception, or defeat. The discernment of a weakness in the enemy camp (a discernment often linked with the evaluation of the capabilities of that particular enemy force) may lead a command to undertake action not previously planned, or to change an offensive or a defensive concept radically. Such a weakness might be the discovery that a sector of the front is being held by inadequate enemy forces, or that the enemy in a given offensive action has suffered excessive losses of men and materiel.

Only in certain cases, however, as in the field of psychological warfare, do the search for and the determination of specific vulnerabilities become the methodological essence of the intelligence activity and the basis of attack procedures.

In the domain of strategic intelligence it is apparent that informational activity with respect to a probable or a declared adversary must be oriented toward determining capabilities and vulnerabilities in the complex of his strategic structure.

In the field of strategic operational intelligence immediate and tangible results may be attained from the discernment and

evaluation of the enemy's vulnerabilities. Results may be sufficient to justify an informational report establishing the enemy's most probable lines of action, and influencing one's own possible courses of action.

Tactical Information

Tactical intelligence is that knowledge concerning the enemy and his circumstances in a zone of operations concerned with tactical objectives, or even strategic objectives, of direct and immediate interest to the commanders and staffs of the units in the field.

Every intelligence problem of a tactical character, as well as those of a strategic character, due to the overlapping and interdependence between strategic and tactical intelligence, always has reference to a situation which constitutes the basis of at least a general knowledge of the enemy and his circumstances. The necessity for resolving a particular intelligence problem arises, for the most part, in reference to a mission which has been entrusted to a unit. It is of a breadth, and requirement in point of details, proportional to the level of the unit itself.

As is well-known, the responsibility of defining to his intelligence unit what he must know concerning the enemy so that he may best accomplish the mission he has received devolves on the commander of the unit. It is incumbent on the commander to frame the intelligence problem with a thought to reducing the gamut of possible surprises to a minimum and of confirming one or more of the hypotheses he has formulated on the basis of the knowledge he already has of the enemy, his own situation, and the terrain.

On the other hand, it is the particular mission of the intelligence unit to succeed in establishing the enemy's situation and circumstances as related to the requirements anticipated by the commander, even to the point of tendering an opinion not only with regard to the capabilities of the

enemy but also with regard to the degree of probability of his putting them into action. The intelligence unit must also discover his probable weak points and consequent vulnerabilities that may be exploited.

The determination of the enemy situation is a reply to the requests of the commander. In this reply the enemy's capabilities and vulnerabilities, as related to the particular mission, occupy the leading place.

In the field of tactical intelligence, enemy capabilities are those lines of action and operational acts the enemy is materially capable of and which, if undertaken by him, can influence the fulfillment of our mission. There are two conditions, then, that define a capability: first, the enemy must have the forces and the means for undertaking that particular line of action; second, if the enemy undertakes it, it will exert a direct influence on the fulfillment of our mission. This represents nothing more than the translation into explicit terms of the enemy's elements of strength—in other words, *what the enemy is able to do against us*. Every capability that can influence the fulfillment of his mission is of interest to the commander for the purpose of his decision and for rendering him as well-prepared as possible for conducting his action with a reduced number of unforeseen occurrences.

In the evaluation which the commander works out for reaching his decision, some enemy capabilities may assume determinative importance in certain cases. In fact, rather than standing in the way of the fulfillment of the mission he has received, they may actually favor it. From the analysis made of the elements of strength of the enemy, there may emerge one element which, if not essentially an element of weakness, is of such a nature as definitely to influence the decision of the commander.

For example, in an attack on an enemy defense position that is strong in static

elements but less strong in its ability to react, it could be better to undertake a laborious turning of an exposed flank rather than a frontal attack.

In a situation such as this in which the enemy's vulnerability is not so much represented by his exposed flank as by his incapability of reinforcing it in time and of reacting by maneuver, all elements of weakness would disappear if the enemy received reinforcements in time to increase his reserves. Thus the element of time enters.

There always exists, alongside the elements of strength, elements of weakness which can move the commander to give a completely new physiognomy to his decision if detected in time. In certain situations they may influence his own capabilities of action in a decisive manner.

Principal Aspects

As we have stated, recent (Italian) doctrine points out the principal aspects toward which the research of the intelligence unit must be directed, namely: personnel, operations, means, and logistics.

It seems worthwhile to go into more detail in regard to each subject.

Personnel: deficiency in replacement systems; a disproportionate number of men who are either too young or too old; units made up of troops from a certain region which, in previous actions, have shown themselves to be lacking in combat capacity; a high percentage of men who are ill; cases of epidemic; lack of resistance or of adaptability to the existing climatic conditions; organic strength of the units much below that anticipated; morale especially low.

Operations: habitual repetitions of plans of maneuver or of deployment; defective organization of the ground; inappropriate distribution of reserves or inadequate mobility of the same; incomplete training of troops for a particular mission; inadequate artillery support; troop concentrations in the face of atomic conditions.

Means: deficiency in equipment of personnel; lack of certain materiel in certain sectors (mines, antitank weapons, tanks, atomic weapons).

Logistics: a scarcity of certain supplies; deficiencies and obstructions in the logistical organization; excessive dependence on a single communication route; especially vulnerable points along communication routes.

Miscellaneous aspects toward which search should be directed include:

Intelligence: whenever there exists, for example, the possibility of deceiving or of neutralizing given intelligence organizations, or if one discovers excessive dependence, on the part of the enemy's intelligence services, on certain sources for their information.

The *personalities* of the enemy commanders who, on the basis of their past actions, may be expected to present particular points of weakness (excessive reliance on the defensive form of combat, or boldness in attack not supported by adequate organization).

This list is necessarily incomplete but may give an idea of the points toward which the intelligence unit must direct its research efforts.

The intelligence unit must then arrive at the determination of vulnerabilities by means of a comparative analysis of the outstanding weak points discovered, calling attention to them for exploitation by the operational units or the commander.

Intelligence activity aimed at the detection of the weak points and vulnerabilities presented by the enemy not only informs us of "what the enemy is able to do," but at the same time, provides a knowledge of "what we should do to the enemy."

This new concept—which gives to the intelligence activity an offensive, and not merely a defensive picture of the situation—finds its chief reason for existence in the necessity for stimulating a permanent offensive attitude, even in defense.

Two Basic Questions

There are two basic questions pertaining to vulnerabilities: one relative to the framing of the intelligence problem by the commander, and one relative to the responsibilities of the intelligence unit.

The first question could be expressed as follows: should the commander in framing the intelligence problem include among his EEI (essential elements of information) definite requests relative to enemy vulnerabilities, as is done with reference to the enemy's capabilities?

At first thought the reply would seem to be negative. It is obvious, in fact, that it would not be possible for the intelligence units, at all levels, to explore all or part of the elements relative to the enemy's points of weakness, or even to be aware of their existence.

But many bits of information gathered by various sources and by the intelligence units at the various levels can gradually give concrete form to a weak point or a peculiarity of the enemy. The detection of a weak point would be very improbable at the lower levels. The systematic and co-ordinated assembling of numerous bits of evidence, which is possible only at the higher levels, can result in the feeling that there is something in a certain domain which warrants investigation and, as a result, gives rise to intelligence research. Research which is requested and oriented in this direction, whether on the part of the lower or the higher levels, may result in the discovery of the weak point and in providing sufficient material for defining the vulnerability.

It can happen, however, that a commander who has ample time to arrive at a decision may desire the maximum number of items of information to check against one another relative to a given aspect of weakness on the part of the enemy. He may even order investigation in the direction of a particular element which could turn out to be an element of weak-

ness. In this sense, and only in this sense, can an affirmative reply be given to the question posed.

In regard to the second question, one point would seem to be unequivocal: the responsibility of the intelligence unit must be limited to the presentation of a vulnerability without suggestion of how the advantage offered by this or that vulnerability could be exploited. The task of examining the possible exploitation of vulnerabilities must remain the responsibility of the commander or of his operational organization.

Therefore, the activity of the intelligence unit must be confined to pointing out, on the basis of the informational elements in its possession, the enemy's weak points, listing them, explaining why they can be regarded as weak points, analyzing and defining them.

In the catalogue of vulnerabilities there also must be included the vulnerabilities which could be exploited by the higher levels. For example, a division that is boxed in might be incapable of exploiting the incapacity of the enemy for replenishing his unit after suffering especially heavy losses in men and materiel, while this vulnerability could be exploited at a higher level.

One example will give more vividness to what has been said up to this point. The level of the units which will be considered was quite high, for although the intelligence procedures in investigation and evaluation of capabilities and vulnerabilities are quite similar at all levels, they are more striking at the strategic domain.

In the autumn of 1944, 70 Allied divisions were pressing at the gates of Germany over the 800 kilometers of front between the sea and the Vosges. The Allied offensive was aimed at crushing the German defenses of the Western Rampart in order to reach the Rhine and cross it at several points before the arrival of

winter. There were clear signs in the German camp which indicated that collapse could be near at hand, and the Allies did not conceal their belief that the war in Europe could be over before Christmas.

The Allies had the four divisions of the VIII Army Corps manning around 140 kilometers of front which, due to its "quiet condition," was regarded both by the Americans and the Germans as ideal for the reconstitution of the divisions that already had been engaged and for familiarization of new units entering the fight.

On the east the Russians had not reached the Vistula, and were still far from the German soil, while the Allies were now at the gates of Germany. Once detected, this weak point in the Allied deployment called for exploitation by the German military logic. German doctrine assigned a temporary value only to the defensive form of war.

The German Intelligence Service had been able, in spite of the existing situation, to detect the Allied vulnerability represented by too extended a front. The German Command consequently had considered the possibility of taking maximum advantage of it.

The counteroffensive plan took form in an order emanating on 6 November 1944 from the command of Army Group B of Von Rundstedt to the commands of the Fifth and Sixth Armored Armies and of the Seventh Army, comprising a total of 14 armored divisions and 20 divisions of infantry. It was based on a single, fundamental element, *surprise*, for which the operation was prepared with a degree of secrecy, security, and deception, perhaps never before found in any other operation. Suffice it to say that even the commander of the German Sixth Armored Army, constituted for the occasion and the real protagonist of the battle, was kept in the dark regarding its beginning until four days before the operation commenced. Only

during the two days preceding the beginning of the operation was his army permitted to move to the position of departure.

In the Allied camp the danger represented by the Ardennes sector was well-known (the German offensive in this sector in 1940 was still fresh in memory), but this danger was looked on as a "calculated risk" in relation to the possibilities offered of the continuation, with all available forces, of the offensive in other sectors. In spite of the security measures taken by the Germans, many reports indicated the existence of new units in that sector, and many things pointed, especially after 1 December, to the preparation of a counterattack in force. An example was the interception of an order given to certain air reconnaissance units of the Luftwaffe to reconnoiter the bridges over the Meuse.

In no estimate of the enemy's situation by those of the highest level down to those of the division level was the "possibility" considered of a grand style German counteroffensive. In no case was an acceptable degree of probability given to this course of action. Only in the case of the First Army, to which the VIII Army Corps belonged, is precise reference made to this possibility in the determination of the situation dated 10 December.

In the section relative to enemy possibilities, the commander of the intelligence unit wrote as follows:

1. The enemy can continue his defense of the line of the river Roer. . . .
2. The enemy, with tank and infantry units supported by aviation and special branches, can launch a counterattack at a point of main effort and at a time chosen by him.
3. The enemy can defend the line of the Erft and then withdraw back of the Rhine.
4. The enemy may become disorganized or surrender.

In determining, one after the other, the

degree of probability of the listed possibilities, he declared that possibility 1 was the most probable; the 2d "to be expected when our forces have passed the river Roer . . ." In his conclusions, however, he was more explicit: "The continuous increase of enemy forces west of the Rhine leads one to think seriously that the enemy may gamble everything on the counterattack outlined in possibility 2."

Although this intelligence caused a certain degree of alarm in the Allied commands, it was not given, due to its quasi-concealed prophetic character, sufficient weight to cause countermeasures to be taken. On the other hand, in the determination of the enemy situation of 9 December by the Twelfth Army Group to which the First Army belonged, the estimate of the strength of the enemy forces in the Ardennes zone did not exceed six and a half divisions, as opposed to the seven German divisions which began the offensive and the other 14 which were progressively thrown into the battle, an indication of the success of the security measures taken by the Germans.

Postwar criticism has not been kind to the Allied intelligence organs in this particular contingency. They have been accused, principally, with having allowed themselves to be seized with "attack psychosis," thus losing the capacity for maintaining a constant objectivity of judgment, and of not having been able to carry out their investigations in depth.

Regardless of the results of the German counteroffensive, this much is known: the losses by the Americans were high, and the final Allied victory was delayed perhaps by several months.

Conclusion

For a commander, lack of information can no longer be an excuse, for it is his responsibility to direct the intelligence activity properly.

On the basis of this direction, it must be the definite responsibility of the intelligence unit to attempt, with every means at its command, to present to the commander not only all that it is possible to know concerning the enemy but all that will help in knowing about the enemy in the particular situation. To this end the new intelligence orientation, with which the effort is made to give equal value to the determination of capabilities and to the determination of vulnerabilities, appears logical. Today, in an atomic atmosphere, this seems still more necessary, considering the capabilities and the vulnerabilities of attack and defense as related to the effects which can be achieved with the atomic devices against concentrations of forces.

To succeed, however, in presenting the capabilities and the vulnerabilities of the enemy in a clear, understandable and honest manner requires arduous and patient labor, a sifting of results, supported in their evaluation by sure, critical sense.

Artillery in an Atomic War

Translated and digested by the MILITARY REVIEW from a copyrighted article by General C. A. F. Besançon in "Revue Militaire Générale" (France) December 1956. Preface by Brigadier General P. Renaud.

General Besançon, army corps commander and inspector general of artillery and antiaircraft artillery, had prepared a first draft of this article just before his death in an aircraft accident in North Africa.

With the consent of the general's collaborators at the Office of Artillery Inspection, I was charged with putting the finishing touches on the already very complete first draft which contained all the ideas that are expressed in this article.

IN ALL probability a future war will involve the use of atomic means. The form it will assume will depend on the progress that has been achieved in nuclear projectiles and the means that assure maximum yield in their use. Thus the nations at war may have sufficient atomic means at their command—speaking in terms of quantity and quality—to destroy the greater part of the enemy war potential and to solve all the problems of the battlefield. Or their means may only permit them to destroy a small part of the enemy potential in comparison with his total strength. Also, the atomic projectiles, because of their nature, may remain subject to restrictions in employment and limited to the battlefield.

We neither pretend to nor do we have the opportunity to take a stand on either of these hypothetical situations.

It seems, however, that the different documents that have been made public, and appear to convey the thought of the French and the combined command on the subject, direct our concepts toward a progressive evolutionary solution which sooner or latter will be called the atomic era. As far as we know, the contemplated organizational reforms in the various armies of the world do not appear—at least for the moment—to bear the mark of a complete and radical change.

It is within the program of this evolution that some thoughts on the foreseeable results of the existence of nuclear explosives on the organization and employment of artillery are presented.

The weapon of the artillery is the projectile, and nuclear advances have increased the effectiveness of its firepower to an amazing degree.

The new and extraordinary capability with which firepower has just been enriched will form the basic element of maneuver and fire maneuver which—as a whole—should be organized around the atomic means that will constitute the

framework. If, for the moment, their use and commitment observe certain particular rules and still require special procedures, it seems ill-timed to oppose the atomic to the conventional firepower. Quite to the contrary, they supplement each other and the problem of fires should always be viewed as one.

The appearance of nuclear explosives changes nothing in the over-all missions that can be entrusted to the artillery; in all situations it must remain capable of assuring—with appropriate power and flexibility—direct and indirect support of the other arms.

Offense

In offense the disruption of defensive dispositions of the adversary will be achieved by the massive use of atomic fire which will play an essential role in the execution of a powerful and violent preparation. This will make it possible to overcome the lengthy and expensive preparations of yesteryear which necessitated the assembling of great quantities of conventional means. Such preparations are impossible in these days of atomic threat. Atomic firepower will facilitate the use of surprise and alleviate logistic problems to a great extent. Its employment also could be decisive for the immediate neutralization of dense artillery disposition, as well as operations in depth against reserves, command posts, and enemy lines of communication.

But, apparently, conventional firepower will still be necessary to penetrate advanced positions of the enemy that might escape atomic fires for reasons of safety of friendly troops. Atomic action can be conducted in spite of its endangering friendly advanced positions, if certain risks for advanced elements are taken, or if the command contemplates moving those elements back sufficiently.

However, even under those conditions, conventional firepower will remain necessary to complement atomic firepower, to

ensure the closest possible followup of the advance to reduce scattered points of resistance that the elements of the enemy could establish or that were insufficiently neutralized, and to reduce fresh enemy reserves which may have pushed hastily into the atomized zones.

It is true that the exploitation of the effects of atomic projectiles—which must be swift—is not always too easy. Atomic air bursts actually will have only a limited effect on natural or artificial obstacles. Bursts on or in the ground will create considerable obstacles which will be contaminated for several hours, thus preventing or complicating their crossing. The result will be that the time necessary to develop the exploitation could enable the defending forces to reoccupy certain neutralized zones before they can be reached by the assault echelons.

Finally, direct support of the combat elements that lead the assault not only requires fire conducted within close proximity of friendly troops, but also fire that is immediately available. These requirements could be satisfied by atomic fires only if their use is decentralized. From this point of view, nuclear fires do not seem to be able to substitute completely for conventional firepower—for the moment—that is quickly executed at the initiative of artillery forward observers.

Defense

In defense, atomic firepower will play an important role in preliminary actions on objectives important enough to be worthy of its power. Hence it will be necessary to induce the enemy to concentrate his strength over relatively limited areas. With this aim in mind conventional fires will be usefully combined with obstacles and the maneuver of the other arms, since artillery, due to its range, will be in a position to intervene while at the same time keeping its guns and howitzers away from the danger zones of friendly atomic explosions.

The defense will depend in a large measure on fire maneuver—essentially atomic fire. The effectiveness of this atomic fire maneuver will be linked closely to the number and nature of the available weapons at the various levels of command, on the command means for employing them, and the extent of the decentralization that has been determined for their use.

Defensive atomic action will have as a target the opposing atomic delivery means, the destruction of assault echelons through counterpreparation, the destruction of reserves, and the attempt at strangling the offense by action against rear areas.

Atomic fire will be directed within plans that have been laid in advance and executed on intelligence received; on "targets of opportunity," the acquisition of which creates great problems for the intelligence agencies; and to prepare and support counterattacks in conditions that are similar to those of the offense.

Whatever its importance, atomic firepower alone will not be able to fill all the requirements.

It will be necessary to have recourse to conventional fire as the continuity and the precision of its action will best permit the solving of firing problems in close proximity to friendly troops. Conventional fires also will be indispensable for employment in the gaps created by the tactical dispersion of the enemy and against enemy infiltrations. This is all the more true, since the infantry—due to the intervals between units—will not be able to put up sufficiently dense and continuous barriers.

Atomic fire, therefore, will constitute the base of fire on the battlefield of the future, and its role in fire maneuver will increase at the rate at which the yield of the warhead decreases. Conventional fires will be used to complete, perfect, or supplement atomic firepower.

The execution of the fundamental mis-

sion of the artillery should be based, therefore, on judicious and close coordination between both types of fire, whether from the ground or from the air. Conventional firepower is still particularly indispensable—thinking of the present state of affairs—to ensure the close support of the other arms.

Organization

The general organization and disposition of ground forces is, at present, the subject of many interesting studies in all armies. These generally concern the organizational characteristics of the new divisions and the echelons of command to be retained.

From the sole viewpoint of fire maneuver it appears, taking into account the materiel which seems likely to be available, that the retention of the army and the army corps echelons is indicated.

Army

Army continues as the command level at which coordination with the Tactical Air Command, and the coordination of conventional firepower and missiles (atomic and conventional), will be put into effect.

In the sphere of conventional firepower, army artillery—as a weapons unit—has not operated directly for a number of years. The range of the materiel in use actually was relatively short in comparison with the zone of maneuver as envisaged at that echelon. Of course, it was conceivable that the army commander would retain certain firing units under his direct command for some specific fire missions. But as a general rule army artillery, as an indispensable command and intelligence agency, played an important part only in the distribution of the means that were available to that army and in the allocation of ammunition.

In the future it seems that army will direct fire missions when it has been given

launchers of great power and very long range (normally self-propelled types) that do or do not fire atomic projectiles. This mission could include actions in the rear areas and counterbattery against very long-range enemy weapons.

The great range of these weapons will enable the army artillery to have great flexibility in fire missions. Army will be able to reserve the decision to commit atomic ground artillery by the employment of air-delivered weapons through coordination with the air force. The most favorable range for guided missiles of the army artillery would be approximately 200 or 300 kilometers.

Corps

In the present state of affairs army corps appears to be the level that will have a combination of atomic and conventional firepower.

Responsible as it is for the counterbattery and of operations in the rear areas that are close to the frontlines, at a depth of 50 to 80 kilometers, it should have long-range weapons of great power. In principle, this materiel would be rockets, guided or ballistic, provided they are sufficiently accurate. Heavy artillery gun equipment will be limited because of its lack of range, but will still be necessary until certain technical points of the missiles have been improved. Of course, this equipment will have to be self-propelled in order to have the mobility and speed that is indispensable on a modern battlefield.

Division Artillery

The division artillery, whose basic mission is to assure the direct support of the other arms, essentially will consist of conventional artillery, until atomic projectiles of low yield that can be fired from light and precise launching equipment have been devised.

It also seems that on the atomic battlefield the division will require conventional

firepower at least equal to that required in the past.

Actually, whether it is a question of offense or defense, the fluidity and the interpenetration of the dispositions will make it necessary for the artillery to intervene over wider areas and on targets, perhaps smaller, but certainly more numerous and whose immediate and simultaneous neutralization is essential.

The recognized proportion of artillery in comparison with the other arms will have to remain the same unless equipment is devised that will have a far greater firing speed and considerably increased range. In spite of the increased area of action and the moving character of operations, our new equipment of 105-mm and particularly the French 155-mm, with their range of 14 to 17 kilometers, will be adequate for divisional artillery in proportions presently approved.

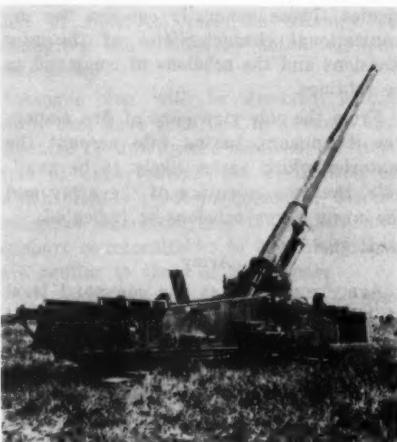
Flexibility

The new form of war demands increased flexibility of maneuver. Artillery equipment must, therefore, be particularly "manageable" so as to increase the speed of maneuver and in order not to burden the movement of the other arms in which they normally will be incorporated for the movement. For this reason, preference should be given to self-propelled equipment with the reservation that its characteristics of mobility, weight, firing ratio, and munition supply be acceptable. Besides, armor, even though it may be light, protects the personnel against nuclear radiation and facilitates the defense of the column. Budgetary considerations undoubtedly will prohibit the equipping of all units with self-propelled equipment. Some will have to be content with towed materiel.

At this time it is not possible to give precise details of the employment and the commitment of atomic equipment. The available list of munitions, the nature of the launching equipment and the means

for guidance, the organization of the units, and their assignment to the different command echelons are under continuing study. But it is necessary to underline several points with respect to the use and the commitment of means on the atomic battlefield.

The dispersion that large units should adopt to avoid the threat of nuclear explosives will mean a great increase in their areas of deployment. This dispersion



280-mm gun

will alternate with rapid maneuvers, ending in momentary concentrations that will remain necessary for mass actions.

On the other hand, the low density of the means, the risk of infiltration, as well as the necessity to cover the existing gaps between the units with firepower, will require that all points of the zone of action be effectively covered by fire.

The result for the artillery will be a combination of centralization—an essential factor of its power—and decentralization that is, above all, imposed by the inadequate range of its equipment.

The centralization and decentralization

of the firepower are not so much in opposition as complementary. A flexible and effective organization of liaison and communications should make it possible to obtain both at the same time without great difficulty.

But at the other end of the trajectory, the problem of decentralization or centralization of the firing units raises many controversies.

Often it will be necessary, as a consequence of dispersion, to locate artillery units among units of the other arms. Moreover, certain situations will make it mandatory to form combined-arms groups which would include artillery units. However, to integrate artillery units in elementary formations of other arms systematically would provide them with equipment whose range would be in excess of their need as well as their capabilities and would, therefore, constitute a potential waste.

The various formations of all arms—no longer being able to benefit by the balance of firepower of the artillery—themselves would then require their own means of fire support. It will be practically impossible to assure them power and mobility at the same time; they would run the risk either of being inadequately equipped, or burdened to a degree that would be incompatible with the maneuver speed expected of them.

Besides, if they were to be rigidly integrated in the dispositions of the basic units of the other arms, the artillery units would be subject to frequent displacement which would render them momentarily unavailable for fire maneuver.

The interarms (combined arms) command, therefore, has to be flexible in adaptation and organization to guarantee instantaneous firepower to those elements that lead in combat.

If the decentralization of units proves to be necessary in certain situations, it must, nevertheless, not lead to a system-

atic "crumbling" of the arm which would be prejudicial to its usefulness and which would adversely affect the support it renders.

Intelligence

The yield of atomic firepower actually demands that the artillery have means available not only to detect and locate the target, but also to follow it and to continue its surveillance up to the time of the launching.

The gathering of intelligence, when methodically followed up in depth, will have as a principal aim the determination of possible objectives for friendly atomic firepower.

Particular importance certainly will be accorded to the atomic counterbattery fire, the location of enemy launching sites, logistic echelons, command posts, and guidance means. The neutralization or the destruction of these dispositions will be essential factors of a successful offense or defense.

In the zones of contact artillery will, in the future, have more dispersed and camouflaged targets which will disperse or displace in directions that will be difficult to foresee. These targets will be more numerous, less easy to detect and locate, and more mobile. The area to be covered in gathering intelligence will be much greater. *There must be no gaps in this sphere of endeavor, and intelligence must be obtained covering the total of the zone of contact.*

Observation

The problem of "what to fire on" will become more and more important and increasingly difficult to solve. Therefore, observation will be more necessary and laborious.

Of course, appeal will be made largely to the air forces and to the air means that form part of the ground forces, such as observation planes and helicopters. But it also will be necessary to increase the number of forward observation posts. The

use of commandos or observers that have been left or infiltrated among the enemy will have to be envisaged. A study of the use of robot planes and guided missiles that are equipped with television or photographic devices will have to be made. Certain echelons of the artillery command will have to be assigned intelligence units that are provided with all the technical means for the detection of targets to include sound-flash, radar, and infrared.

Logistics

As is the case with the other arms, artillery action on the atomic battlefield will doubtless be hindered by logistic difficulties and by the scarcity of supply.

The amount of ammunition authorized for a given period of time or for each phase of a maneuver should, therefore, be the object of close examination of the combined arms chief on the basis of precise propositions of this artillery commander—it should be strictly adapted to the desired results and as limited as possible.

The organization and deployment of artillery will be determined only when the over-all organization of the large units and the nature of the materiel with which they will have been equipped has been defined. When this is done it will be expedient to inquire as to whether the inner structure of our artillery units should not be modified in order to increase their usefulness and mobility and to adapt them to the deployment of the other arms.

Since the means are limited and since the committing of forces will be based on surprise, a relative separation of the intelligence and observation agencies which need a certain degree of stability may be necessary. This includes the liaison agencies which must remain closely linked to the disposition of the other arms and other elements of firepower that operate over vast areas.

In any case, the new organization should

respond to the following imperative conditions:

Enable all infantry or armor commanders to obtain the firepower they need without delay through only one artillery commander.

Maintain a close and permanent liaison between the leading combat troops and the artillery.

Permit the coordination of heavy mortar fire of the infantry and eventually the fire of the tanks with that of the artillery, as well as the artillery fire with that of the air force.

Facilitate a speedy changeover from decentralization to centralization and vice versa.

Ensure maximum flexibility and mobility of units.

Provide artillery units with the necessary organic means to assure their safety.

Conclusion

For the transitory period, this study affirms that with nuclear projectiles the artillery stays on the battlefield as the weapon of great firepower in range as well as in depth.

At some future date there will be "atomic plenty" and a variety of launching means of all calibers. These will assure flexibility with considerable range. Tactical atomic projectiles of a minimum power of 0.5 kilotons, and a maximum power of 500 kilotons, will permit the resolution of all the problems of firepower on the battlefield without difficulty. At this time, having become almost entirely atomic, the artillery—although greatly reduced in number of weapons—will be all-powerful; this firepower will become essential in the argument of maneuver.

Perhaps there will then be a return to the formula of 1917: "Artillery conquers. . . ."

But in any event, artillery will be more than ever the "weapon of the commander."

BOOKS OF INTEREST TO THE MILITARY READER

THE UPPER ATMOSPHERE. By H. S. W. Massey and R. L. F. Boyd. 333 Pages. The Philosophical Library, Inc., New York. \$17.50.

By LT COL GEORGE D. CARNAHAN, *Ordn*C

This is an authoritative account of the phenomena of the upper atmosphere studied during the International Geophysical Year. Present-day knowledge of the subject is outlined and the techniques used in investigation are described fully.

The study of the properties of the upper atmosphere is of great scientific interest, is important in relation to many of man's normal activities, and is an essential prerequisite before any explorations of outer space by manned vehicles or otherwise can be carried out effectively and, in the former case, safely.

In the first chapter the authors recall certain of the fundamentals of electricity and magnetism, describe in the barest essentials the nature of wave motion with respect to sound and electromagnetic waves, and summarize those aspects of atomic and molecular physics which are referred to in later chapters. In the next chapter the main atmospheric properties and phenomena are summarized without explaining how the information was obtained.

The next three chapters cover in detail the methods used to obtain the data given in the second chapter. Other chapters are devoted to consideration of the important external influences and their effects. Opportunity is taken to provide a more ex-

tensive account of the different phenomena concerned as well as to discuss the way in which they arise. A description of the use of artificial satellites is given, followed by a brief concluding chapter dealing with future prospects.

Subjects such as these cannot be explained without the use of mathematics, although there is nothing in this book requiring advanced knowledge, and some chapters succeed in avoiding mathematical exposition altogether.

This is a book for students, for scientists in other fields who require a reliable outline of the subject, and for those technically interested in space travel.

ROCKET ENCYCLOPEDIA ILLUSTRATED. Edited by John W. Herrick and Eric Burgess. Foreword by Dr. Theodore von Karman. 607 Pages. Aero Publishers, Inc., Los Angeles, Calif. \$12.50.

By LT COL G. B. MACAULAY, *Arty*

Here is a comprehensive, authoritative volume of known rocket facts and theory.

Profusely illustrated with photographs and diagrams, the book contains a wide variety of rocket information including principles, theories, developments, progress, and descriptions of all types of rockets.

The explanations are clear and concise and written in a readable style.

Rocket Encyclopedia Illustrated is an interesting and educational book for the layman and a valuable reference volume for the technician.

THE IMPACT OF AIR POWER. Edited by Eugene M. Emme. 914 Pages. D. Van Nostrand Co., Inc., Princeton, N. J. \$12.50.By LT COL HOWARD L. FELCHLIN, *Inf*

In his preface Mr. Emme has stated that "this book attempts to make fully clear the problems created by the rise of air power as an instrument of national policy and by its influence upon the ways and means of achieving national security." To this end he has selected approximately 118 articles written by a wide variety of authorities who discuss the evolution of airpower from its earliest years to the role it will play in the future.

As one "part of a great Air Force publishing program," it appears that *The Impact of Air Power* has the underlying purpose of documenting in repetitive detail the thesis that airpower is the key to victory and the fundamental instrumentality of achieving national objectives.

On occasion the author recognizes the contribution of the other services toward winning wars and preserving the peace. He includes an article by General Bradley entitled "Air Power and Army Operations" in which Bradley states:

The most important over-all conclusion of this report is the firm verification of the interdependence of our land, sea, and air forces, each upon the other.

Included also is General Twining's comment that:

I do not wish to imply that the Air Force is, by itself, an adequate military power. Effective ground forces, supported by air transport and tactical air forces, and naval power are essential elements of the military power we must maintain if war is to be avoided.

The too infrequent use of similar comments by competent individuals prevents the book from being a sound, balanced

analysis of the true role of airpower in preserving our national security.

The chapters pertaining to the evolution of airpower, Soviet air policy, and future warfare make interesting background reading for understanding some of the intricate problems of national defense that face us today.

THE STORY OF AVIATION. By David C. Cooke. 264 Pages. *Archer House, New York.* \$4.95.By MAJ KEITH C. NUSBAUM, *Arty*

Mr. Cooke is the Aviation Editor of the North American Newspaper Alliance, and has written over 300 articles and 17 books on aviation since the age of 16 when he sold his first article on the subject. His latest book is an extremely well-presented summary of the history of aviation. It reads like a novel.

After a summary of fact and legend surrounding the beginnings of man's attempts to master the air, and a history of some little-known but remarkably close tries at successful manned aircraft, the author next covers man's first winged flight and then the main theme of his book—military aviation and aviators.

One of the most interesting features of *The Story of Aviation* is the large number of illustrations, many of historic value.

As a source of reference material, or merely for an enjoyable as well as profitable few hours of interesting reading, this book is recommended to those interested in aviation and its story.

NAVAL LEADERSHIP. Second Edition. Compiled by Commander Malcolm E. Wolfe, USN; Captain Frank J. Mulholland, USMC; Commander John M. Laudenslager, MSC, USNR; Lieutenant Horace J. Connery, MSC, USN; Rear Admiral Bruce McCandless, USN (Retired); and Associate Professor Gregory J. Mann, U. S. Naval Academy. 301 Pages. *United States Naval Institute, Annapolis, Md.* \$3.50.

THE ARMY AND ECONOMIC MOBILIZATION. U. S. Army in World War II. By R. Elberton Smith. 749 Pages. Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. \$5.25.

This magnificently readable handling of a complex and often only partially understood subject will be of constantly increasing value to researchers and planners as the bible of economic mobilization, although, as Mr. Smith points out, "in World War II the United States was favored by a combination of circumstances which may never recur."

The broad pattern of economic mobilization for the war is represented as an orderly and systematic process which ran the full scale of planning, buildup, production, and demobilization. However, the confusion, mistakes, profiteering, and the inevitable competitive scramble are not disregarded.

The book starts with the background of prewar planning and peacetime organization, and deals separately with the determination of Army requirements before and after Pearl Harbor. A major portion of the volume is devoted to Army purchasing problems and policies and the expansion of facilities for the Army. A complete discussion of production and material controls follows, with a recapitulation of the contract settlement and termination that was handled, according to the author, with a program that was boldly conceived and boldly executed. He also notes that while there was considerably more fraud and "overpayment" than there ought to have been, it is not at all certain that there was more than could be expected, considering the scope, complexity, and urgency of the program.

This book will make a welcome and valuable addition to reference libraries, and military readers will find it intensely interesting, if somewhat lengthy.

PETER THE GREAT. By Vasili Klyuchevsky. Translated by Liliana Archibald. 282 Pages. St. Martin's Press, Inc., New York. \$6.75.

BY LT COL CHRISTOPHER R. KEEGAN, *Inf*

This is one of the most significant volumes of Vasili Klyuchevsky's five-volume history of Russia, first published in Moscow between 1904 and 1921. It covers the life of Peter the Great and the historical changes made in Russia during this period.

Liliana Archibald has translated and edited this vital volume of Russian history ably and concisely. The book gives an unbiased historical account of Peter's 43 years as Czar of Russia. It covers the policies of his predecessors and the influence these policies had on his many social and administrative changes. The highlights are Peter's interpretation and evaluation of these policies by his own ingenious nature.

This historical account covers Peter's early life; the contest for the throne of Russia; western influences and Peter's westernization of Russia; the construction of St. Petersburg; expansion of the Empire; the Northern War (1700-1721) and the Treaty of Nystad (1721); Peter's development of the armed forces of Russia; and his personal interest and its effect on economic, social, and administrative changes which were not only required during his reign but became a necessity in order to provide for the state and the people.

It includes the contradiction in his work, errors, obstinacy, lack of judgment in civil affairs, uncontrollable cruelty, his wholehearted love of his country, devotion to his work, his daring plans conceived with creative genius, and finally the successes he achieved by the sacrifices of his people and himself.

This book should be a welcome edition to students of Russian history and the general reader who desires to learn more about a vital period of Russia.

THE LONG ARM OF LEE. The History of the Artillery of the Army of Northern Virginia. By Jennings C. Wise. 995 Pages. Oxford University Press, Inc., New York. \$10.00.

BY MAJ WILLIAM F. ENOS, *Inf*

This book has long been the only published account of artillery in the Civil War. While it deals primarily with the artillery of Lee's Army of Northern Virginia, it is a wonderful source of information on the real role that artillery played in the Civil War. Colonel Wise talked with many veterans of the "long arm" and used the "Rebellion Records" and many documented sources for detailed statistics.

The book opens with a brief history of the development of artillery in the United States and Europe since the Revolutionary War. Then follows the almost fantastic story of how the Confederates built their armies and fought at the same time.

A clear picture is drawn of the poor organization and control of the field batteries in the early days of the war. Infantry brigades had isolated batteries attached to them, and reserve artillery rumbled along in the rear, seldom of any use in the fighting. Lessons were learned quickly and battalion organizations were formed and attached to divisions. Reserve battalions were formed and held under corps control for rapid shifting where required. The artillery marched well forward instead of following in the rear.

The bulk of the book is devoted to the detailed part that the artillery played in each battle and campaign from Big Bethel to Petersburg and the end. Statistics on materiel and personnel are detailed, but never boring. Leaders of all ranks are studied—Lee, Hill, Longstreet, Jackson, and other senior commanders as well as all the legendary younger officers such as Pegram, a private in 1861, killed in action at the end of the war as a 22-year-old colonel.

While the subject is approached from a relatively high level of command, and as such deals largely in higher command problems and theory, the sum total is a clear picture of the artillery down through the battery actions.

This book will be of great interest to any general reader of military history. It is a *must* for any real student of the Civil War.

RELATIONS WITH THE INDIANS OF THE PLAINS, 1857-1861. A Documentary Account of the Military Campaigns, and Negotiations of Indian Agents—with Reports and Journals of P. G. Lowe, R. M. Peck, J. E. B. Stuart, S. D. Sturgis, and Other Official Papers. Edited by LeRoy R. and Ann W. Hafen. 310 Pages. The Arthur H. Clark Co., Glendale Calif. \$9.50.

BY LT COL ROBERT M. WALKER, *Arty*

The conquest and occupancy of the high plains east of the central Rocky Mountains were not accomplished without considerable struggle between the red claimants and the white intruders. The climax of this contest ended with the well-known Indian wars of the middle 1860's.

The early preliminary clashes, which form the subject of this volume, have received only meager attention until now. This deficiency regarding the protection of the Platte and Santa Fe routes is ably corrected in this book. It is essentially a documentary account of the military campaigns of the time, the negotiations of the Indian agents, plus reports and journals of some of the participants. This volume is ably edited, carefully indexed, and beautifully documented, bringing the almost forgotten struggles of a century ago into vivid focus.

Readable and authoritative, it is a valuable contribution to realistic history, and both serious researcher and casual reader will find it intensely interesting.

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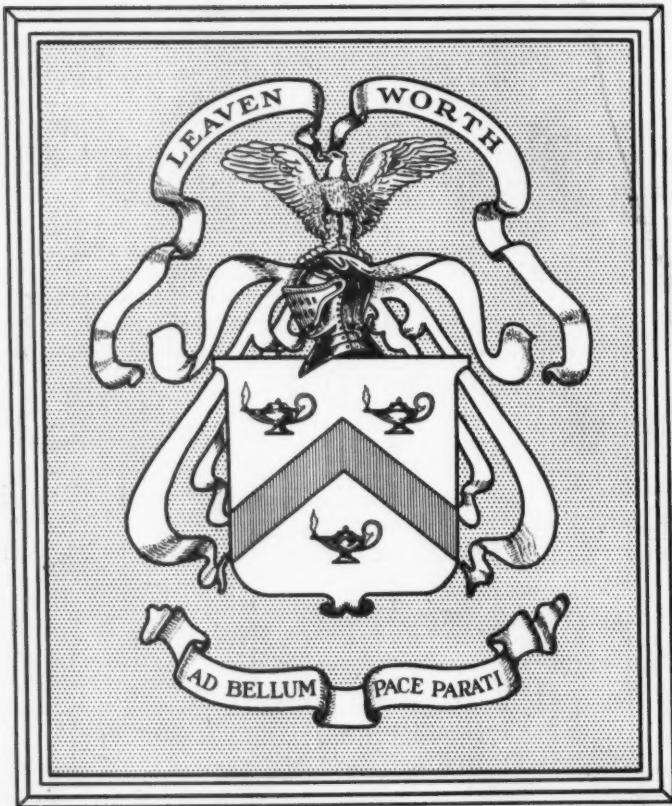
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